Instrument Cluster and Panel Illumination

The instrument cluster and panel illumination system illuminates the following components:

- instrument cluster (10849)
- audio unit (18806)
- A/C-heater control
- fog lamp switch
- transmission range indicator
- traction control switch
- rear window defrost control switch

The instrument cluster is a hybrid electronic cluster (HEC), which uses both hardwired circuitry and the standard corporate protocol (SCP) communication network to transmit and receive information. The Mustang instrument cluster backlighting has illumination bulbs that are installed separately from the instrument cluster. The Cobra instrument cluster has a laminated, electroluminescent applique to backlight the cluster . The electroluminescent applique and instrument cluster must be installed as an assembly.

Instrument Cluster and Panel Illumination

Refer to Wiring Diagrams Cell 71 , Instrument Illumination for schematic and connector information.

Special Tool(s)

ST1137-A	73III Automotive Meter 105-R0057 or equivalent

Inspection and Verification

NOTE: A new instrument cluster must be reconfigured. Refer to Section 418-01 .

NOTE: The instrument panel dimmer switch is a part of the headlamp switch.

1. Verify the customer concern.
2. Visually inspect for obvious signs of electrical damage.

Visual Inspection Chart

Electrical
● Central junction box (CJB) fuses: ■ 5 (15A) ■ 21 (5A) ■ 34 (20A) ■ 37 (5A) ■ 32 (15A) ■ 27 (20A) ● Circuitry ● Damaged switch

3. If the fault is not visually evident, determine the symptom and proceed to the Symptom Chart.

Symptom Chart

Symptom Chart

Condition	Possible Sources	Action
● The control illumination is inoperative	● Central junction box (CJB) fuse 37 (5A). ● Circuitry. ● Headlamp switch.	● Go To Pinpoint Test A .
● The instrument cluster illumination is inoperative	● Circuitry. ● Instrument cluster.	● Go To Pinpoint Test B .

	• Bulb(s).	
• The climate control illumination is inoperative	• Circuitry. • Bulb(s).	• Go To Pinpoint Test C .
• The audio system illumination is inoperative	• Circuitry. • Audio unit.	• Go To Pinpoint Test D .
• A single illumination source is inoperative	• Circuitry. • Switch.	• Go To Pinpoint Test E .

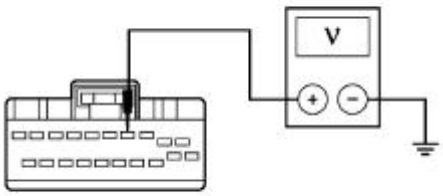
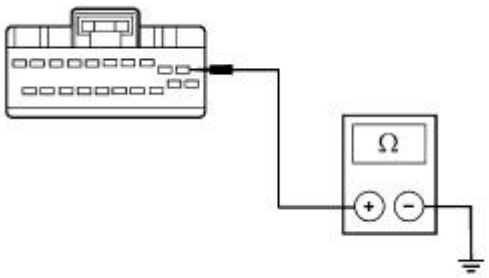
Pinpoint Tests

PINPOINT TEST A: THE CONTROL ILLUMINATION IS INOPERATIVE

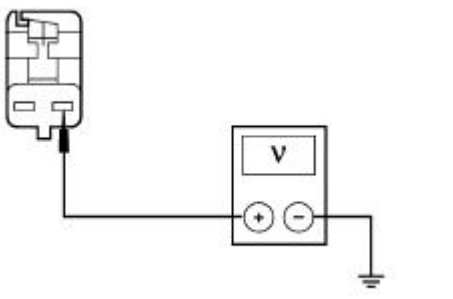
Test Step	Result / Action to Take
A1 CHECK PARKING LAMPS	**Yes** Place the headlamp switch in the OFF position. GO to A2 . **No** REFER to Section 417-01 .
• Place the headlamp switch in the ON position. • **Are the exterior lamps on?**	
A2 CHECK HEADLAMP SWITCH	**Yes** RECONNECT the headlamp switch. GO to A3 . **No** INSTALL a new headlamp switch. REFER to Section 417-01 . TEST the system for normal operation.
• Key in OFF position. • Carry out the headlamp switch components test; Refer to Wiring Diagrams Cell 149 for schematic and connector information. . • **Is the headlamp switch OK?**	
A3 CHECK CIRCUIT 1045 (DB/WH)	**Yes** REPAIR circuit 19 (LB/RD). TEST the system for normal operation. **No** REPAIR circuit 1045 (DB/WH). TEST the system for normal operation.
• Place the headlamp switch in the ON position. • Rotate the instrument panel dimmer switch to the full illumination position. • Measure voltage between central junction box (CJB) fuse 37 (5A) and ground. • **Is the voltage greater than 10 volts?**	

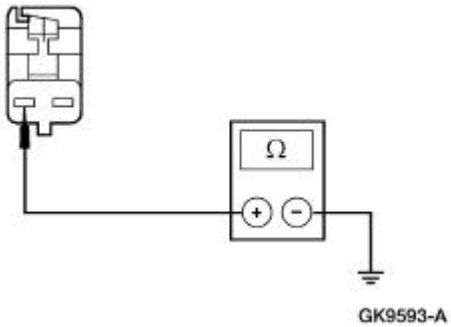
PINPOINT TEST B: THE INSTRUMENT CLUSTER ILLUMINATION IS INOPERATIVE

Test Step	Result / Action to Take
B1 CHECK VOLTAGE TO INSTRUMENT CLUSTER ILLUMINATION	**Yes** GO to B2 .
• Disconnect: Instrument Cluster . • Place the headlamp switch in the ON position. • Rotate the instrument panel dimmer switch to the full	

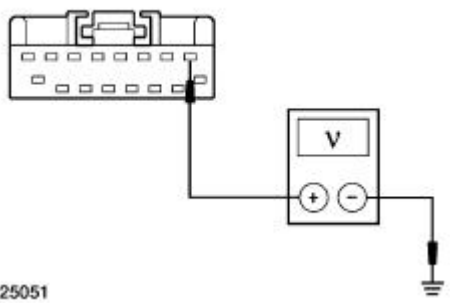
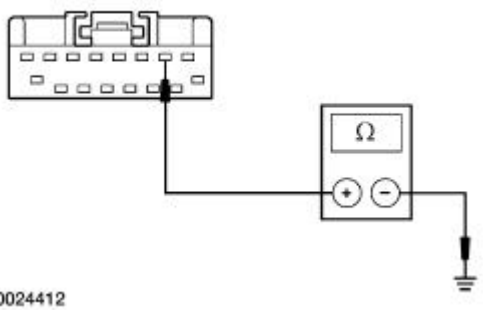
illumination position. ● Measure the voltage between the instrument cluster C220b pin 4, circuit 19 (LB/RD), harness side and ground.  GK9589-A ● **Is the voltage greater than 10 volts?**	**No** REPAIR the circuit. TEST the system for normal operation.
B2 CHECK GROUND TO INSTRUMENT CLUSTER	
● Place the headlamp switch in the OFF position. ● Measure the resistance between the instrument cluster C220b pin 1, circuit 1205 (BK), harness side and ground.  GK9848-A ● **Are the resistances less than 5 ohms?**	**Yes** INSTALL a new instrument cluster. REFER to Section 413-01 . TEST the system for normal operation. **No** REPAIR the circuit. TEST the system for normal operation.

PINPOINT TEST C: THE CLIMATE CONTROL ILLUMINATION IS INOPERATIVE

Test Step	Result / Action to Take
C1 CHECK VOLTAGE TO CLIMATE CONTROL ILLUMINATION	
● Disconnect: Function Selector Switch C294b . ● Place the headlamp switch in the ON position. ● Rotate the instrument panel dimmer switch to the full illumination position. ● Measure the voltage between the function selector switch C294b pin 2, circuit 19 (LB/RD), harness side and ground.  GK9592-A ● **Is the voltage greater than 10 volts?**	**Yes** GO to C2 . **No** REPAIR the circuit. TEST the system for normal operation.
C2 CHECK GROUND TO CLIMATE CONTROL	

• Measure the resistance between the function selector switch C294b pin 1, circuit 1205 (BK), harness side and ground.  GK9593-A • **Is the resistance less than 5 ohms?**	**Yes** INSTALL new illumination bulb(s). REFER to Section 412-04 . **No** REPAIR the circuit. TEST the system for normal operation.

PINPOINT TEST D: THE AUDIO SYSTEM ILLUMINATION IS INOPERATIVE

Test Step	Result / Action to Take
D1 CHECK VOLTAGE TO AUDIO UNIT	
• Disconnect: Audio Unit C290a. • Place the headlamp switch in the ON position. • Rotate the instrument panel dimmer switch to the full illumination position. • Measure the voltage between the audio unit C290a pin 1, circuit 19 (LB/RD), harness side and ground.  A0025051 • **Is the voltage greater than 10 volts?**	**Yes** GO to D2 . **No** REPAIR the circuit. TEST the system for normal operation.
D2 CHECK GROUND TO AUDIO UNIT	
• Measure the resistance between the audio unit C290a pin 2, circuit 1205 (BK), harness side and ground.  A0024412 • **Is the resistance less than 5 ohms?**	**Yes** REMOVE the audio unit and SEND it to an authorized Ford audio systems repair facility. TEST the system for normal operation. **No** REPAIR the circuit. TEST the system for normal operation.

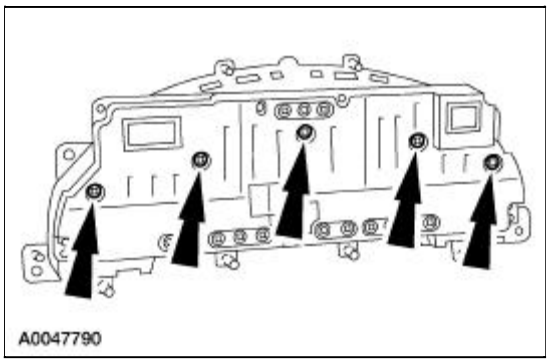
PINPOINT TEST E: A SINGLE ILLUMINATION SOURCE IS INOPERATIVE

Test Step	Result / Action to Take
E1 CHECK VOLTAGE TO THE SINGLE ILLUMINATION SOURCE	
• Disconnect: Inoperative Illumination Source. • Place the headlamp switch in the ON position. • Rotate the instrument panel dimmer switch to the full illumination position. • Measure the voltage between the inoperative illumination source, circuit 19 (LB/RD), harness side and ground. • **Is the voltage greater than 10 volts?**	**Yes** GO to E2 . **No** REPAIR the circuit. TEST the system for normal operation.
E2 CHECK SINGLE ILLUMINATION SOURCE GROUND	
• Measure the resistance between inoperative illumination source, circuit 1205 (BK), harness side and ground. • **Is the resistance less than 5 ohms?**	**Yes** INSTALL a new component in question. TEST the system for normal operation. **No** REPAIR the circuit. TEST the system for normal operation.

Instrument Cluster Bulb

Removal and Installation

1. Remove the instrument cluster. For additional information, refer to Section 413-01 .
2. Remove the necessary instrument cluster bulbs by rotating the bulb one quarter turn counterclockwise and lifting straight out of the instrument cluster.

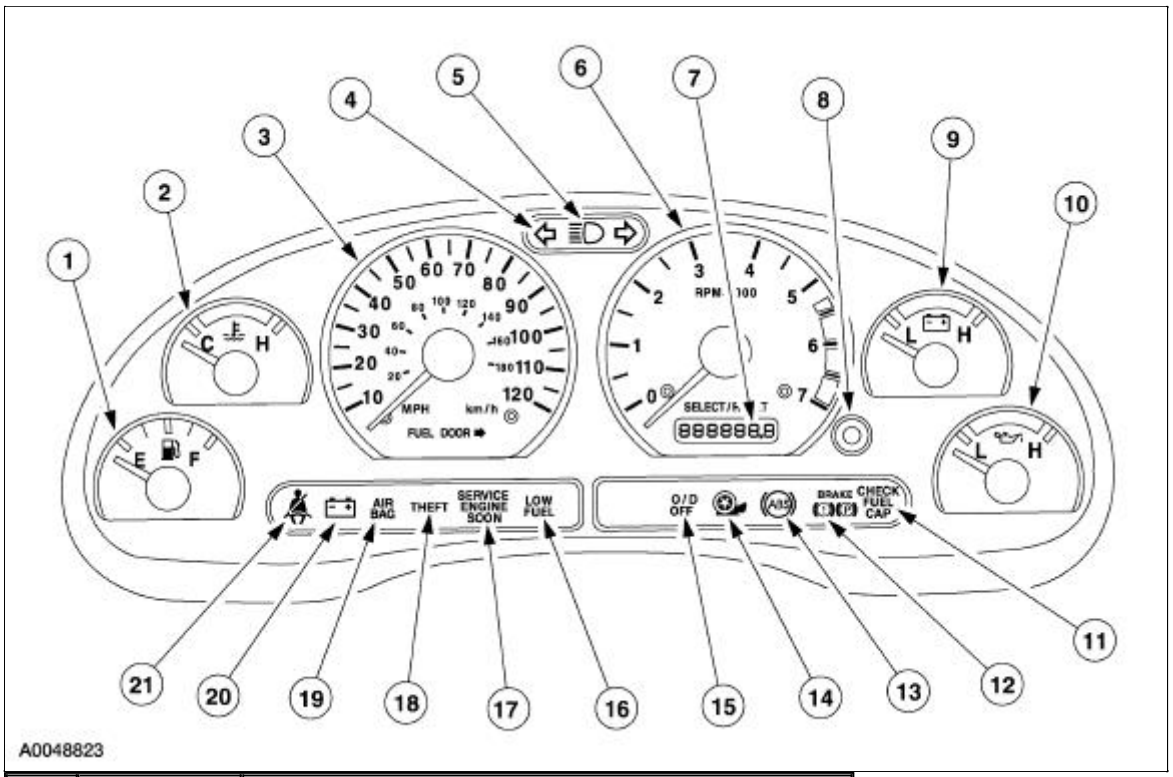


3. To install, reverse the removal procedure.

Instrument Cluster

The instrument cluster (10849) consists of the following components:

Instrument Cluster—Base 3.8L Engine

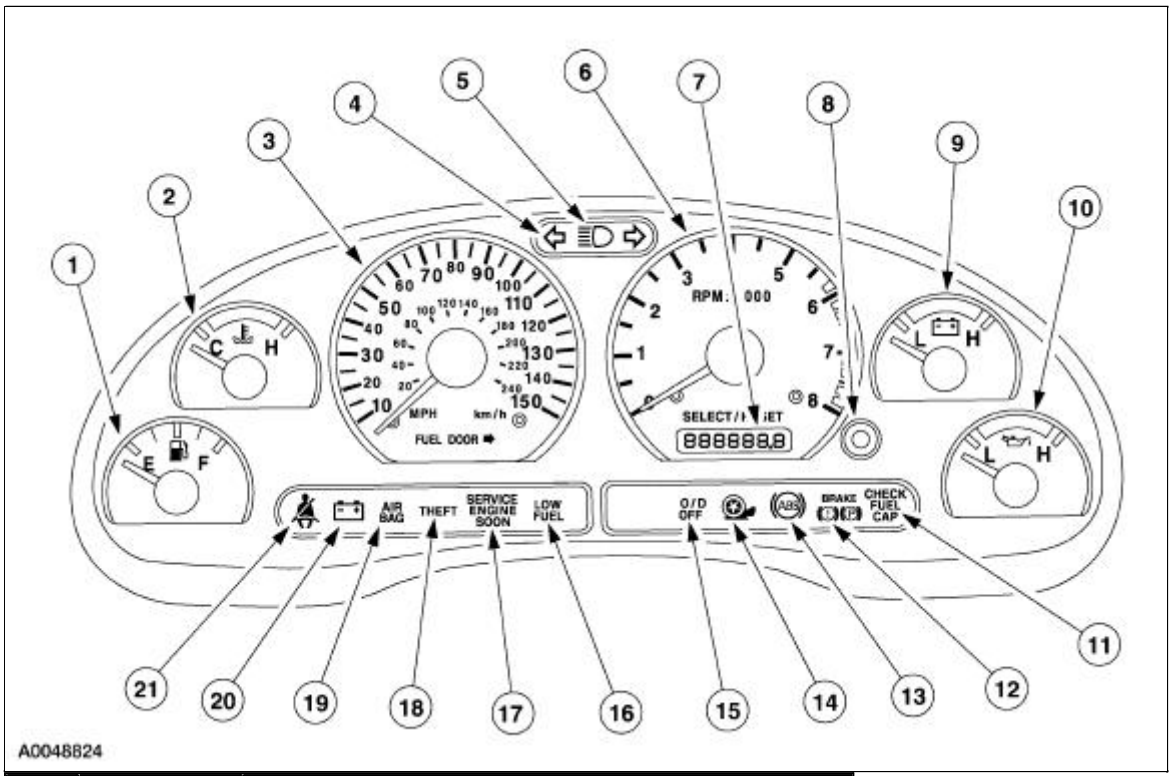


A0048823

Item	Part Number	Description
1	—	Fuel gauge
2	—	Engine coolant temperature gauge
3	—	Speedometer
4	—	Turn signal/hazard indicator
5	—	High beam indicator
6	—	Tachometer
7	—	Odometer
8	—	Trip odometer reset button
9	—	Voltmeter gauge
10	—	Oil pressure gauge
11	—	CHECK FUEL CAP indicator
12	—	BRAKE warning indicator
13	—	ABS warning indicator
14	—	Traction control indicator
15	—	Overdrive off (O/D OFF) indicator (automatic

		transmission)
16	—	LOW FUEL level indicator
17	—	SERVICE ENGINE SOON indicator
18	—	THEFT indicator
19	—	AIR BAG warning indicator
20	—	Charging system indicator
21	—	Safety belt warning indicator

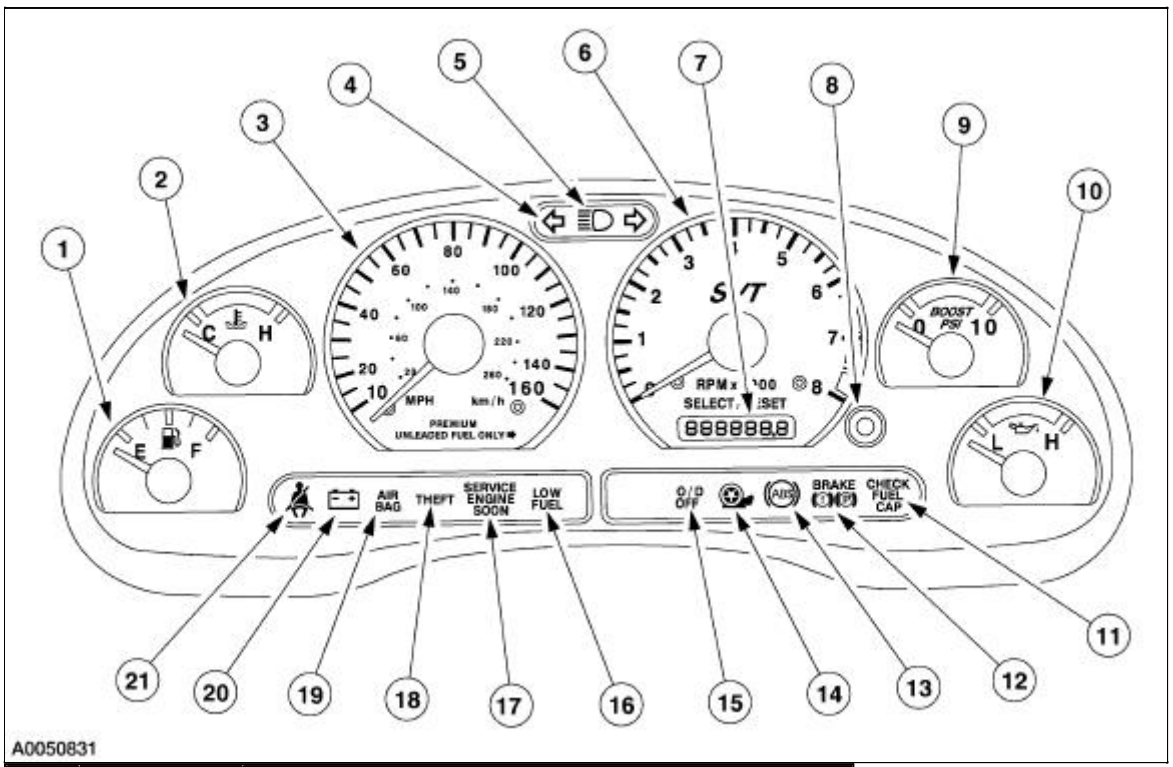
Instrument Cluster—Base 4.6L Engine



Item	Part Number	Description
1	—	Fuel gauge
2	—	Engine coolant temperature gauge
3	—	Speedometer
4	—	Turn signal/hazard indicator
5	—	High beam indicator
6	—	Tachometer
7	—	Odometer
8	—	Trip odometer reset button
9	—	Voltmeter gauge
10	—	Oil pressure gauge
11	—	CHECK FUEL CAP indicator
12	—	BRAKE warning indicator
13	—	ABS warning indicator

14	—	Traction control indicator
15	—	Overdrive off (O/D OFF) indicator (automatic transmission)
16	—	LOW FUEL level indicator
17	—	SERVICE ENGINE SOON indicator
18	—	THEFT indicator
19	—	AIR BAG warning indicator
20	—	Charging system indicator
21	—	Safety belt warning indicator

Instrument Cluster—Cobra



A0050831

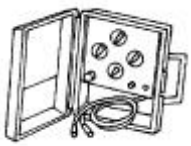
Item	Part Number	Description
1	—	Fuel gauge
2	—	Engine coolant temperature gauge
3	—	Speedometer
4	—	Turn signal/hazard indicator
5	—	High beam indicator
6	—	Tachometer
7	—	Odometer
8	—	Trip odometer reset button
9	—	Boost gauge
10	—	Oil pressure gauge
11	—	CHECK FUEL CAP indicator
12	—	BRAKE warning indicator

13	—	ABS warning indicator
14	—	Traction control indicator
15	—	Overdrive off (O/D OFF) indicator (automatic transmission)
16	—	LOW FUEL level indicator
17	—	SERVICE ENGINE SOON indicator
18	—	THEFT indicator
19	—	AIR BAG warning indicator
20	—	Charging system indicator
21	—	Safety belt warning indicator

Instrument Cluster

Refer to Wiring Diagrams Cell 60 , Instrument Cluster for schematic and connector information.

Special Tool(s)

ST2332-A	Worldwide Diagnostic System (WDS) 418-F224, New Generation STAR (NGS) Tester 418-F052, or equivalent diagnostic tool
 ST1388-A	Instrument Gauge System Tester 014-R1063 or equivalent
ST1137-A	73III Automotive Meter 105-R0057 or equivalent

Principles of Operation

NOTE: A new instrument cluster must be reconfigured. Refer to Section 418-01 .

The instrument cluster is a hybrid electronic cluster (HEC). The instrument cluster uses both hardwired and the standard corporate protocol (SCP) communication network to transmit and receive information. As a technician it is very important to understand:

- where the input originates from.
- all information necessary in order for a feature to operate.
- which module(s) receive(s) the input or command message.
- does the module which received the input control the output of the feature, or does it output a message over the SCP network to another module?
- which module controls the output of the feature.

The instrument cluster carries out a display prove-out to verify that the warning/indicator miniature bulbs for monitored systems are functioning correctly. When the ignition switch is in the ON position with the engine off, the following warning indicators will prove out:

- anti-lock brake (ABS) warning indicator

- air bag warning indicator
- BRAKE warning indicator
- charging system indicator
- fail safe cooling warning indicator
- low coolant level indicator
- low fuel warning indicator
- traction control indicator

Instrument Cluster Replacement

When it is necessary to install a new instrument cluster, contact the Instrument Cluster Program.

Gauge Indication Systems

Tachometer

Engine rpm information is relayed to the instrument cluster from the powertrain control module (PCM) over the standard corporate protocol (SCP) network.

Speedometer

The instrument cluster receives the vehicle speed signal from the PCM over the SCP network and displays it on the speedometer gauge. If the instrument cluster receives no vehicle speed signal after one second, the speedometer defaults to 0.0 km/h (0.0 mph).

Odometer

The instrument cluster receives an odometer message from the PCM and stores the mileage in memory. When the instrument cluster fails to receive the odometer message for more than two seconds, the odometer will display dashes.

Fuel Gauge

The fuel sender is hardwired to the fuel gauge. When the instrument cluster fails to receive the fuel level signal for more than 33 seconds, the fuel level gauge will move below E (empty). If the fuel level signal operates correctly for more than 33 seconds, the fuel gauge will return to the correct position.

Fuel fills of less than 9.5 liters (2.5 gallons) require at least 10 minutes to update the fuel gauge indication.

Engine Coolant Temperature Gauge

Engine coolant temperature information is received by the instrument cluster from the PCM over the SCP network. Engine coolant temperatures above 121°C (250°F) will cause the gauge to indicate above the normal band. If the engine coolant temperature information is missing or invalid for five seconds, the temperature gauge will indicate below the cold (C) position.

Voltage Gauge (except Cobra)

The voltage gauge displays the system voltage as measured at the instrument cluster run input.

Boost Gauge (Cobra only)

The boost pressure gauge on the instrument cluster receives and measures the boost pressure directly from the intake manifold. The boost pressure gauge will display between 0.0-0.48 kpa (0.0-10 psi) boost pressure dependent upon accelerator position, engine load, and engine rpm.

LOW FUEL Level Indicator

The low fuel level indicator is hardwired from the fuel sender to the instrument cluster. The instrument cluster will illuminate the low fuel indicator when the usable fuel quantity is less than 1/8 tank (15%) of fuel tank capacity.

Oil Pressure Gauge

The oil pressure gauge is hardwired from the oil pressure switch to the instrument cluster. The oil pressure gauge will indicate either normal or no oil pressure.

CHECK FUEL CAP

The CHECK FUEL CAP indicator is used to indicate significant leaks in the fuel tank evaporative system due to a loose fuel cap. Fuel tank pressure is monitored by the PCM. If a leak is detected the PCM signals a fault to the instrument cluster via the SCP network. Once the PCM has detected a loose fuel cap and the CHECK FUEL CAP indicator is illuminated, the indicator will remain illuminated until the fuel cap is secured and the vehicle has been running for several minutes. For additional information, refer to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.

BRAKE Warning Indicator

The BRAKE warning indicator activates when the generic electronic module (GEM) detects the ignition switch circuits are in the RUN state, when the GEM detects low brake fluid level, or that the parking brake is applied. The BRAKE warning indicator will prove out starting when the GEM detects that the ignition circuits have made a transition to RUN or START from OFF, ACC, or keyout and ending when either three seconds have elapsed or when the GEM detects the ignition circuits have made a transition to OFF, ACC, or keyout.

Safety Belt Warning Indicator

The safety belt switch is hardwired to the GEM. The safety belt warning indicator will be illuminated when the GEM sends a ground signal to the instrument cluster.

ABS Warning Indicator

The ABS warning indicator will be illuminated when the anti-lock brake control module sends a ground signal to the instrument cluster. The prove-out of the ABS indicator is controlled by the anti-lock brake control module.

SERVICE ENGINE SOON Indicator

The SERVICE ENGINE SOON indicator receives its signal from the PCM over the SCP network. If the instrument cluster does not receive a message from the PCM within five seconds, the instrument cluster will illuminate the SERVICE ENGINE SOON indicator and log a diagnostic trouble code (DTC).

High Beam Indicator

The high beam indicator will illuminate when the steering column multifunction switch is in the high beam position by sending a battery signal to the instrument cluster.

Right and Left Turn Indicator

The right and left turn indicators will illuminate when the steering column multifunction switch is in either turn signal position or hazard lamps position by sending a battery signal to the instrument cluster.

AIR BAG Warning Indicator

The AIR BAG warning indicator will be illuminated when the restraint control module (RCM) sends a ground signal to the instrument cluster. The prove-out of the AIR BAG warning indicator is controlled by the RCM.

THEFT Indicator

The THEFT indicator provides a passive anti-theft system (PATS) prove-out. The THEFT indicator will prove out for three seconds following the ignition switch cycle and will flash following an ignition switch OFF transition to indicate that PATS is active.

Charging System Indicator

The charging system indicator will be illuminated when the generator provides a ground signal to the instrument cluster. The instrument cluster provides a prove-out when the ignition switch is in the RUN position with the engine off. When the engine is started, the generator removes the ground to the instrument cluster and extinguishes the charging system indicator.

Overdrive Off (O/D OFF) Indicator

The O/D OFF indicator is controlled by the off/on message sent from the PCM over the SCP network. The instrument cluster does not provide a prove-out for the O/D OFF indicator, but will remain illuminated if the overdrive has been commanded off following the instrument cluster prove-out.

Traction Control Indicator

During initialization, the instrument cluster will receive the traction control system state status message from the traction control module to determine if the vehicle is equipped with traction control. If the vehicle is equipped with traction control, this information will be stored in random access memory (RAM) and the indicator will prove out for three seconds during each ignition cycle. If this message is not received, the instrument cluster will assume that the vehicle is not traction control equipped and the indicator will remain off. When the traction control is active, the traction control module sends the instrument cluster a traction control active signal and the instrument cluster illuminates the traction control indicator. When the traction control is inactive, the traction control module removes the traction control active signal and the instrument cluster turns off the indicator.

In the event of a traction control failure, the traction control indicator will remain off and the ABS indicator will illuminate.

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical and electrical damage.

Visual Inspection Chart

Mechanical	Electrical
● Fuel tank	● Central junction box (CJB) fuse(s):

• Engine coolant level • Accessory drive belt • Engine oil level • Parking brake position switch • Brake fluid level • Boost gauge pressure line	▪ 5 (15A) ▪ 7 (15A) ▪ 11 (15A) ▪ 13 (15A) ▪ 21 (5A) ▪ 23 (15A) ▪ 24 (30A) ▪ 29 (15A) ▪ 30 (15A) ▪ 32 (15A) ▪ 34 (20A) ▪ 35 (15A) ▪ 37 (5A) ▪ 38 (20A) ▪ 39 (5A) • Circuitry

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

4. If the concern remains after the inspection, connect the diagnostic tool to the data link connector (DLC) located beneath the instrument panel and select the vehicle to be tested from the diagnostic tool menu. If the diagnostic tool does not communicate with the vehicle:
   - check that the program card is correctly installed.
   - check the connections to the vehicle.
   - check the ignition switch position.

5. If the diagnostic tool still does not power up, refer to the diagnostic tool operating manual.

6. Carry out the DATA LINK DIAGNOSTICS test. If the diagnostic tool responds with:
   - CKT914, CKT915 OR CKT70 = ALL ECUS NO RESP/NOT EQUIP, refer to Section 418-00 .
   - NO RESP/NOT EQUIP for the instrument cluster, Go To Pinpoint Test A or for the generic electronic module (GEM), Go To Pinpoint Test W .
   - SYSTEM PASSED, retrieve and record the continuous diagnostic trouble codes (DTCs), erase the continuous DTCs and carry out the self-test diagnostics for the instrument cluster or the GEM.

7. If the DTCs retrieved are related to the concern, go to the Instrument Cluster Diagnostic Trouble Code (DTC) Index or the GEM Diagnostic Trouble Code Index to continue diagnostics.

8. If no DTCs related to the concern are retrieved, proceed to the Symptom Chart to continue diagnostics.

Instrument Cluster Self-Diagnostic Mode

To enter the instrument cluster self-diagnostic mode, press and hold the instrument cluster SELECT/RESET button, turn the ignition switch to the RUN position, and then continue pressing the SELECT/RESET button (five seconds) until tESt is displayed in the odometer. The SELECT/RESET button must be released within three seconds of the odometer tESt display to begin the self-diagnostic mode. Press the SELECT/RESET button to advance through the following steps until dtc is displayed. Depressing the SELECT/RESET button will display any stored continuous DTCs before proceeding to the next step.

Odometer Display	Description
GAGE	Activates gauge sweep of all gauges, then displays present gauge values. Also carries out the checksum tests on ROM and EE.
All segments illuminated	Illuminates all odometer segments.
bulb	Illuminates all micro-controlled indicators and LEDs. Install a new indicator or LED as necessary.
r	Returns to normal operation of all micro-controlled indicators and LEDs and displays hexadecimal value for ROM level (used when requesting assistance from the hotline).
EE	Displays hexadecimal value for EE level (used when requesting assistance from the hotline).
dt	Displays hexadecimal coding of final manufacturing test date (used when requesting assistance from the hotline).
dtc	Displays continuous DTCs in hexadecimal format. Pressing the SELECT/RESET button will display any DTCs stored before proceeding to the next step.
enG	Displays the English speed in mph. Speedometer will indicate present speed within tolerances. Display will show 0 if input is not received, if input received is invalid for one second or more, or if speed is 0.
m	Displays the metric speed data (km/h). Speedometer will indicate present speed within tolerances. Display will show 0 if input is not received, if input received is invalid for one second or more, or if speed is 0.
tAc	Displays the tachometer data received from the PCM via the SCP network within tolerances. Tachometer will indicate present rpm. Display will show 0 if input is not received, if input received is invalid for one second or more, or if engine rpm is 0.
FUEL	Displays the code (0-255) for the fuel sender input to the instrument cluster. The fuel gauge will display a filtered fuel level value. This filter will keep the pointer from moving suddenly or erratically. ● 255 = open send +/- 0 ● 232 = full stop +/- 0 ● 215 = full mark +/- 10 ● 178 = 3/4 mark +/- 8 ● 138 = 1/2 mark +/- 7 ● 93 = 1/4 mark +/- 5 ● 41 = E mark +/- 4 ● 54=LOW FUEL (0-59) ● 0-18=short (0-20 max)
OIL	Displays the code (0-250) for the oil pressure switch input to the instrument cluster. Oil pressure gauge will indicate present oil pressure. Normal oil pressure (greater than 6 psi) will display a value between 000 and 176. A low oil pressure or an inoperative engine oil pressure switch (less than 6 psi) will display a value greater than 176.
dEGC	Display of engine temperature in degrees C input from cylinder head temperature sensor. ● 49 C = "C" mark ● 60 C = normal band start ● 120 C = normal band end ● -40 C = no SCP message for 5 seconds
bAtt	Displays the code (0-255) for the battery voltage input to the instrument cluster. Battery voltage gauge will indicate present battery voltage.

	● 93-102 = 6.9-9.1 volts (low voltage) ● 115-124 = 8.5-10.7 volts (norm band start) ● 215-225 = 15.8-18 volts (norm band end) ● 230-241 = 16.9-19.1 volts (high voltage)
rhEo	Displays the present decimal rheostat dimming input, 0-255 (used when requesting assistance from the hotline).
rhi rhS rho	Not used.
Cr	Displays the present RUN/START sense input. Display will show -h for high input with the ignition switch in the START position and -L for low input with the ignition switch in the RUN position.
PA-PE7	Not used.
GAGE	Repeats test display cycle.

To exit the instrument cluster self-diagnostic mode, turn the ignition switch to the OFF position or press and hold the SELECT/RESET button for three or more seconds and release.

Instrument Cluster Diagnostic Trouble Code (DTC) Index

Diagnostic Tool Displayed DTC	Self-Diagnostic Mode Displayed DTC	Description	Source	Action
B1202	9202	Fuel Sender Open Circuit	Instrument Cluster	Go To Pinpoint Test B .
B1204	9204	Fuel Sender Short to Ground	Instrument Cluster	Go To Pinpoint Test B .
B1317	9317	Battery Voltage High	Instrument Cluster	Section 414-00 .
B1318	9318	Battery Voltage Low	Instrument Cluster	Section 414-00 .
B1342	9342	ECU is Defective	Instrument Cluster	INSTALL a new instrument cluster; REFER to Instrument Cluster in this section. TEST the system for normal operation.
B1343	9343	Heated Backlight Input Circuit Failure	Instrument Cluster	Section 501-11 .
B1356	9356	Ignition Run Circuit Open	Instrument Cluster	Go To Pinpoint Test A .
B1364	9364	Ignition Start Circuit Open	Instrument Cluster	Go To Pinpoint Test A .
B2143	A143	Odometer NVM Mmory Failure	Instrument Cluster	Go To Pinpoint Test J .
C1284	5284	Oil Pressure Switch Failure	Instrument Cluster	Go To Pinpoint Test C .
P1197	1197	Mileage Switch Circuit Failure	Instrument Cluster	Go To Pinpoint Test J .

GEM Diagnostic Trouble Code (DTC) Index

DTC	Description	Source	Action
B1218	Horn Relay Coil Circuit Short to VBatt	GEM	REFER to Section 501-14B .
B1312	Lamp Headlamp Input Circuit Short to Battery	GEM	REFER to Section 413-09 .
B1317	Battery Voltage High	GEM	REFER to Section 414-00 .
B1318	Battery Voltage Low	GEM	REFER to Section 414-00 .
B1322	Driver Door Ajar Circuit Short to Ground	GEM	REFER to Section 417-02 .
B1330	Passenger Door Ajar Circuit Short to Ground	GEM	REFER to Section 417-02 .
B1334	Decklid Ajar Rear Door Circuit Short to Ground	GEM	REFER to Section 417-02 .
B1339	Chime Input Request Circuit Short to Battery	GEM	REFER to Section 413-09 .
B1340	Chime Input Request Circuit Short to Ground	GEM	REFER to Section 413-09 .
B1342	ECU is Defective	GEM	Clear the DTCs. Retrieve the DTCs. If DTC B1342 is retrieved, INSTALL a new GEM. REFER to Section 419-10 .
B1353	Ignition Key-In Circuit Open	GEM	REFER to Section 413-09 .
B1359	Ignition Run/Acc Circuit Failure	GEM	REFER to Section 211-05 .
B1396	Power Door Lock Circuit Short to Battery	GEM	REFER to Section 501-14B .
B1397	Power Door Unlock Circuit Short to Battery	GEM	REFER to Section 501-14B .
B1405	Driver Power Window Down Circuit Short to Battery	GEM	REFER to Section 501-11 .
B1408	Driver Power Window Up Circuit Short to Battery	GEM	REFER to Section 501-11 .
B1426	Lamp Safety Belt Circuit Short to Battery	GEM	Go To Pinpoint Test K .
B1428	Lamp Safety Belt Circuit Failure	GEM	Go To Pinpoint Test K .
B1431	Wiper Brake/Run Relay Circuit Failure	GEM	REFER to Section 501-16 .
B1432	Wiper Brake/Run Relay Circuit Short to Battery	GEM	REFER to Section 501-16 .
B1434	Wiper Hi/Low Speed Relay Coil Circuit Failure	GEM	REFER to Section 501-16 .
B1436	Wiper Hi/Low Speed Relay Coil Circuit Short to Battery	GEM	REFER to Section 501-16 .
B1438	Wiper Mode Select Switch Circuit Failure	GEM	REFER to Section 501-16 .
B1441	Wiper Mode Select Switch Circuit Short to Ground	GEM	REFER to Section 501-16 .

B1446	Wiper Park Sense Circuit Failure	GEM	REFER to Section 501-16 .
B1448	Wiper Park Sense Circuit Short to Battery	GEM	REFER to Section 501-16 .
B1450	Wiper Wash/Delay Switch Circuit Failure	GEM	REFER to Section 501-16 .
B1453	Wiper Wash/Delay Switch Circuit Short to Ground	GEM	REFER to Section 501-16 .
B1458	Wiper Washer Pump Motor Relay Circuit Failure	GEM	REFER to Section 501-16 .
B1460	Wiper Washer Pump Motor Relay Coil Circuit Short to Battery	GEM	REFER to Section 501-16 .
B1462	Safety Belt Switch Circuit Failure	GEM	REFER to Section 413-09 .
B1466	Wiper Hi/Low Speed Not Switching	GEM	REFER to Section 501-16 .
B1473	Wiper Low Speed Circuit Motor Failure	GEM	REFER to Section 501-16 .
B1476	Wiper High Speed Circuit Motor Failure	GEM	REFER to Section 501-16 .
B1551	Decklid Release Circuit Failure	GEM	REFER to Section 501-14B .
B1553	Decklid Release Circuit Short to Battery	GEM	REFER to Section 501-14B .
B1555	Ignition Run/Start Circuit Failure	GEM	REFER to Section 211-05 .
B1687	Lamp Dome Input Circuit Short to Battery	GEM	REFER to Section 417-02 .
B2486	Parklamp Output Relay Driver Circuit Failure	GEM	REFER to Section 419-01 .
B2488	Parklamp Output Relay Driver Short to Battery	GEM	REFER to
C1189	Brake Fluid Level Sensor Input Short Circuit to Ground	GEM	Go To Pinpoint Test O .
C1223	Lamp Brake Warning Output Circuit Failure	GEM	Go To Pinpoint Test O .
C1225	Lamp Brake Warning Output Circuit Short to Battery	GEM	Go To Pinpoint Test O .

Symptom Chart

Symptom Chart

Condition	Possible Sources	Action
● No communication with the generic electronic module (GEM)	● Central junction box (CJB) fuse (s): ■ 7 (15A). ■ 39 (5A). ■ 43	● Go To Pinpoint Test W

	(20A). ● Battery junction box (BJB) fuse 12 (40A). ● Circuitry. ● GEM.	
● No communication with the instrument cluster	● Central junction box (CJB) fuse (s): ■ 11 (15A). ■ 21 (5A). ■ 34 (20A). ● Circuitry. ● Standard corporate protocol (SCP) network. ● Instrument cluster.	● Go To Pinpoint Test A .
● Incorrect fuel gauge indication	● Circuitry. ● Fuel pump module. ● Instrument cluster.	● Go To Pinpoint Test B .
● Incorrect oil pressure gauge indication	● Circuitry. ● Engine oil pressure switch. ● Instrument cluster.	● Go To Pinpoint Test C .
● Incorrect temperature gauge indication	● Circuitry. ● Engine coolant temperature sensor. ● Powertrain control module (PCM). ● Instrument cluster.	● Go To Pinpoint Test D .
● Incorrect voltage gauge indication—except Cobra	● Circuitry. ● Generator. ● Standard corporate protocol (SCP) network. ● Instrument cluster.	● Go To Pinpoint Test E .
● Incorrect tachometer indication	● Standard corporate protocol (SCP) network. ● Powertrain control module (PCM). ● Instrument cluster.	● Go To Pinpoint Test F .
● Incorrect boost gauge	● Pressure line.	● Go To Pinpoint Test G .

indication—Cobra only	• Instrument cluster.	
• The LOW FUEL warning indicator is never/always on	• LOW FUEL warning indicator bulb. • Standard corporate protocol (SCP) network. • Instrument cluster.	• Go To Pinpoint Test H .
• Oil gauge reads normal with engine off	• Instrument cluster.	• INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
• The speedometer is inoperative	• Standard corporate protocol (SCP) network. • Powertrain control module (PCM). • Instrument cluster.	• Go To Pinpoint Test I .
• The odometer is inoperative	• Circuitry. • Powertrain control module (PCM). • Instrument cluster.	• Go To Pinpoint Test J .
• The safety belt warning indicator is inoperative (chime is operative)/does not operate correctly	• Circuitry. • Generic electronic module (GEM). • Instrument cluster.	• Go To Pinpoint Test K .
• Inaccurate speedometer reading	• Instrument cluster. • Powertrain control module (PCM).	• Go To Pinpoint Test L .
• The O/D OFF indicator is never on	• Circuitry. • O/D cancel switch. • O/D OFF indicator bulb. • Standard corporate protocol (SCP) network. • Powertrain control module (PCM). • Instrument cluster.	• Go To Pinpoint Test M .
• The O/D OFF indicator is always on	• Circuitry. • O/D cancel switch.	• REFER to the Powertrain Control/Emissions Diagnosis (PC/ED)

	• Powertrain control module (PCM).	manual.
• The CHECK FUEL CAP INDICATOR is never on	• Circuitry. • Standard corporate protocol (SCP) network. • Powertrain control module (PCM).	• Go To Pinpoint Test N .
• The CHECK FUEL CAP INDICATOR is always on	• Circuitry. • Powertrain control module (PCM). • Fuel system.	• REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.
• The BRAKE warning indicator is never/always on	• Circuitry. • Low brake fluid level. • Brake fluid level switch. • Parking brake switch. • Instrument cluster. • Generic electronic module (GEM).	• Go To Pinpoint Test O .
• The charging system warning indicator is never/always on	• Circuitry. • Generator. • Charging system warning indicator bulb. • Instrument cluster.	• Go To Pinpoint Test P .
• The high beam indicator is never/always on	• Circuitry. • High beam indicator bulb. • Instrument cluster.	• Go To Pinpoint Test Q .
• The air bag warning indicator is never/always on	• Circuitry. • Air bag warning indicator bulb. • Instrument cluster. • Restraint control module (RCM).	• REFER to Section 501-20B .
• The anti-lock brake system (ABS) warning indicator is never on	• Circuitry. • ABS warning indicator bulb. • Anti-lock brake control module. • Instrument cluster.	• Go To Pinpoint Test R .
• The ABS warning indicator is always on	• Circuitry. • Anti-lock brake control module.	• REFER to Section 206-09A or Section 206-09B .

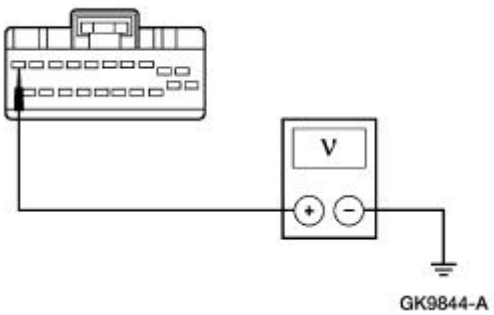
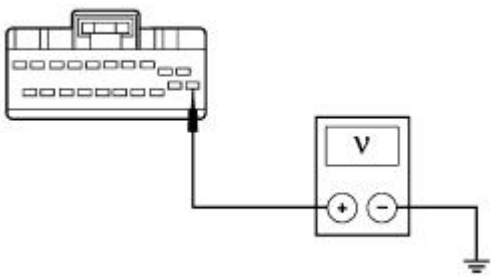
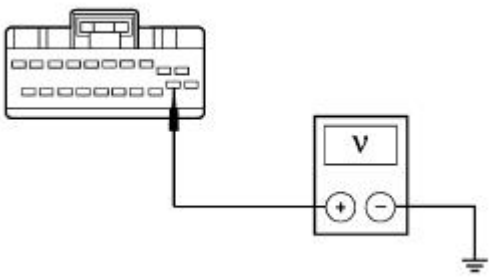
• The SERVICE ENGINE SOON indicator is never/always on	• Circuitry. • SERVICE ENGINE SOON indicator bulb. • Powertrain control module (PCM). • Instrument cluster.	• Go To Pinpoint Test S .
• The turn/hazard indicator is never/always on	• Circuitry. • Turn/hazard bulb(s). • Instrument cluster.	• Go To Pinpoint Test T .
• The THEFT indicator is never/always on	• Circuitry. • THEFT indicator LED. • Instrument cluster.	• REFER to Section 419-01 .
• The traction control indicator is never/always on	• Circuitry. • Traction control switch. • Standard corporate protocol (SCP) network. • Powertrain control module (PCM). • ABS module. • Instrument cluster.	• Go To Pinpoint Test U .
• The integrated circuit display is inoperative/erratic	• Instrument cluster.	• Go To Pinpoint Test V .

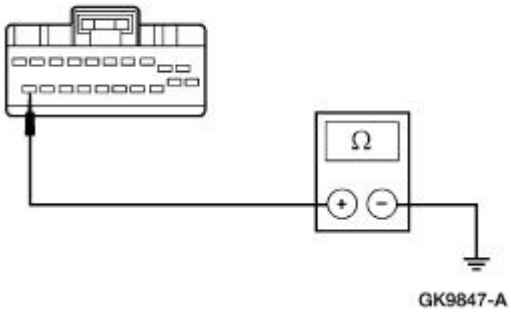
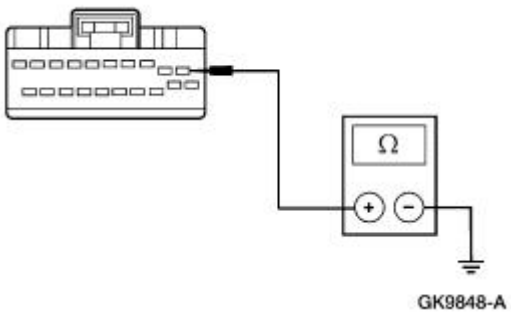
• The instrument cluster is inoperative	• Central junction box (CJB) fuse (s):
	  ■ 11 (15A).
	  ■ 21 (5A).
	  ■ 34 (20A).
	• Circuitry.
	• Instrument cluster.
		• Go To Pinpoint Test V .

Pinpoint Tests

PINPOINT TEST A: NO COMMUNICATION WITH THE INSTRUMENT CLUSTER

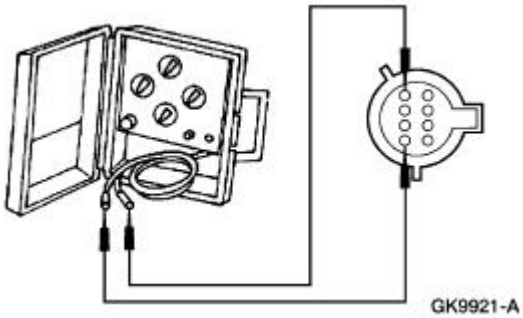
Test Step	Result / Action to Take

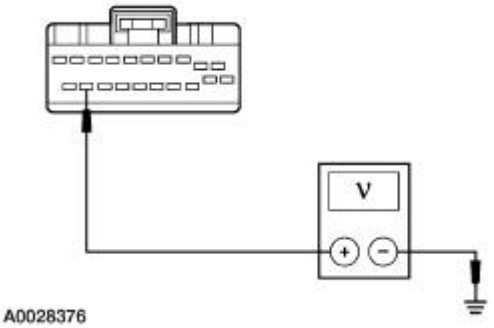
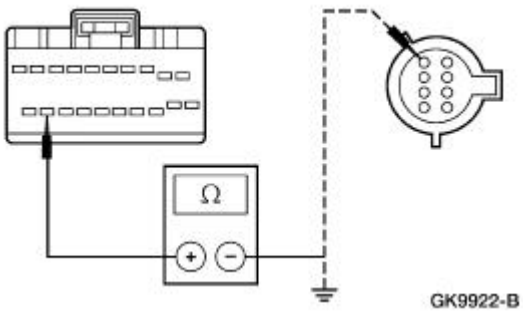
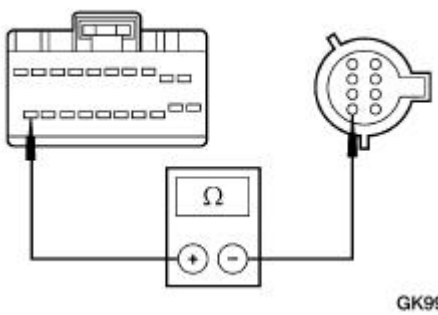
A1 CHECK THE BATTERY POWER SUPPLY TO THE INSTRUMENT CLUSTER	
CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector. • Key in OFF position. • Disconnect: Instrument Cluster C220b. • Measure voltage between the instrument cluster C220b pin 10, circuit 729 (RD/WH), harness side and ground.  GK9844-A • **Is the voltage greater than 10 volts?**	**Yes** GO to A2. **No** REPAIR the circuit. TEST the system for normal operation.
A2 CHECK THE RUN POWER SUPPLY TO THE INSTRUMENT CLUSTER	
• Key in ON position. • Measure the voltage between the instrument cluster C220b pin 11, circuit 489 (PK/BK), harness side and ground.  GK9845-A • **Is the voltage greater than 10 volts?**	**Yes** GO to A3. **No** REPAIR the circuit. TEST the system for normal operation.
A3 CHECK THE RUN/START POWER SUPPLY TO THE INSTRUMENT CLUSTER	
• Key in OFF position. • Disconnect: Instrument Cluster C220b. • Key in ON position. • Measure the voltage between the instrument cluster C220b pin 12, circuit 20 (WH/LB), harness side and ground.  GK9846-A • **Is the voltage greater than 10 volts?**	**Yes** GO to A4. **No** REPAIR the circuit. TEST the system for normal operation.

A4 CHECK GROUND CIRCUIT 397 (BK/WH) FOR AN OPEN	
• Key in OFF position. • Measure the resistance between the instrument cluster C220b pin 20, circuit 397 (BK/WH), harness side and ground.  GK9847-A • **Is the resistance less than 5 ohms?**	**Yes** GO to A5 . **No** REPAIR the circuit. TEST the system for normal operation.
A5 CHECK GROUND CIRCUIT 1205 (BK) FOR OPEN	
• Measure the resistance between the instrument cluster C220b pin 1, circuit 1205 (BK), harness side and ground.  GK9848-A • **Is the resistance less than 5 ohms?**	**Yes** REFER to Section 418-00 . **No** REPAIR the circuit. TEST the system for normal operation.

PINPOINT TEST B: INCORRECT FUEL GAUGE INDICATION

Test Step	Result / Action to Take
B1 CARRY OUT THE INSTRUMENT CLUSTER FUEL GAUGE ACTIVE COMMAND	
CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector. NOTE: Fuel fills of less than 9.5 liters (2.5 gallons) require at least 10 minutes to update the fuel gauge indication. • Key in ON position. • Select the instrument cluster FUELLEVEL active command. Trigger, monitor, and scroll FUELLEVEL at: 0% , 50%, and 100%. • **Does the fuel gauge display: below E at 0%, half at 50%, and F at 100%?**	**Yes** GO to B2 . **No** GO to B8 .
B2 CHECK THE FUEL GAUGE OPERATION	
• Key in OFF position. • Disconnect: Fuel Pump Assembly C463. • Connect one lead of the Instrument Gauge System Tester to the fuel pump module C463 pin 5, circuit 29 (YE/WH), harness side and the other lead of the Instrument Gauge System Tester to the	**Yes** GO to B3 . **No** GO to B5 .

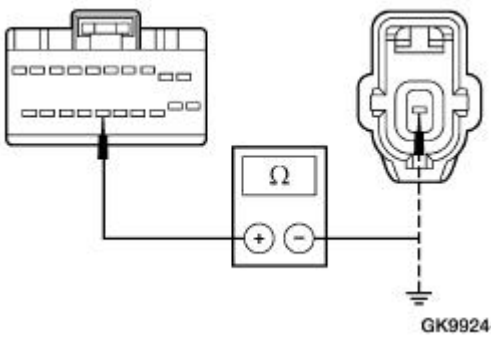
fuel pump module C463 pin 8, circuit 327 (BK/OG), harness side.  ● Set the Instrument Gauge System Tester to 160 ohms. ● Key in ON position. ● Turn the ignition switch to RUN for one second. ● Key in OFF position. ● Set Instrument Gauge System Tester to 15 ohms. ● Key in ON position. ● **NOTE:** The fuel gauge should read E or below when carrying out this test step. ● Wait one minute and read the fuel gauge. ● Key in OFF position. ● Set Instrument Gauge System Tester to 160 ohms. ● Key in ON position. ● **NOTE:** The fuel gauge should read F (full) or above when carrying out this test step. ● Wait one minute and read the fuel gauge. ● Key in OFF position. ● **Does the fuel gauge operate correctly?**	
B3 CHECK THE FUEL TANK	
● Check the fuel tank for any damage or deformation. ● **Is the fuel tank OK?**	**Yes** GO to B4 . **No** INSTALL a new fuel tank; REFER to Section 310-01 . TEST the system for normal operation.
B4 CHECK THE FUEL PUMP ASSEMBLY	
● Check the fuel pump assembly in-tank mounting, float, float rod, wiring and connections for damage or obstruction. ● **Is the fuel pump assembly and wiring OK?**	**Yes** INSTALL a new fuel sender. TEST the system for normal operation. **No** REPAIR as necessary. TEST the system for normal operation.
B5 CHECK CIRCUIT 29 (YE/WH) FOR SHORT TO POWER	
● Disconnect: Instrument Cluster C220b. ● Key in ON position. ● Measure the voltage between the instrument cluster C220b pin 19, circuit 29 (YE/WH), harness side and ground.	**Yes** REPAIR the circuit. TEST the system for normal operation. **No** GO to B6 .

 A0028376 ● **Is any voltage present?**	
B6 CHECK THE FUEL PUMP ASSEMBLY FEED CIRCUIT 29 (YE/WH)	
● Key in OFF position. ● Measure the resistances between the instrument cluster C220b pin 19, circuit 29 (YE/WH), harness side and the fuel pump module C463 pin 5, circuit 29 (YE/WH), harness side; and between the instrument cluster C220b pin 19, circuit 29 (YE/WH), harness side and ground.  GK9922-B ● **Is the resistance less than 5 ohms between the instrument cluster and the fuel pump module and greater than 10,000 ohms between the instrument cluster and ground?**	**Yes** GO to B7 . **No** REPAIR the circuit. TEST the system for normal operation.
B7 CHECK FUEL PUMP MODULE GROUND CIRCUIT 327 (BK/OG) AND CIRCUIT 397 (BK/WH)	
● Measure the resistance between the instrument cluster C220b pin 20, circuit 397 (BK/WH), harness side and the fuel pump module C463 pin 8, circuit 327 (BK/OG), harness side.  GK9923-A ● **Is the resistance less than 5 ohms?**	**Yes** GO to B8 . **No** REPAIR the circuit(s) in question. TEST the system for normal operation.
B8 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	

● Disconnect all instrument cluster connectors.
● Check for:
  ● corrosion
  ● pushed-out pins
● Connect all instrument cluster connectors and make sure they seat correctly.
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for

• Operate the system and verify the concern is still present. • **Is the concern still present?**	normal operation. **No** The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST C: INCORRECT OIL PRESSURE GAUGE INDICATION

Test Step	Result / Action to Take
C1 CHECK THE INSTRUMENT CLUSTER OPERATION	
CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector. • Connect the diagnostic tool. • Key in ON position. • Enter the following diagnostic mode on the diagnostic tool: Instrument Cluster Active Command. • Trigger the instrument cluster active command OIL GAUGE. Scroll to 0%, 50%, and 100%. • **Did the gauge display L at 0%, the middle of the gauge at 50%, and H at 100%?**	**Yes** GO to C2 . **No** GO to C3 .
C2 CHECK CIRCUIT 31 (WH/RD) FOR OPEN OR SHORT TO GROUND	
• Key in OFF position. • Disconnect: Instrument Cluster C220b. • Disconnect: Oil Pressure Switch C103. • Measure the resistances between the instrument cluster C220b pin 16, circuit 31 (WH/RD), harness side and the oil pressure switch C103, circuit 31 (WH/RD), harness side; and between the instrument cluster C220b pin 16, circuit 31 (WH/RD), harness side and ground.  • **Is the resistance less than 5 ohms between the instrument cluster and the oil pressure switch, and greater than 10,000 ohms between the instrument cluster and ground?**	**Yes** INSTALL a new oil pressure switch. TEST the system for normal operation. **No** REPAIR the circuit. TEST the system for normal operation.
C3 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	
• Disconnect all instrument cluster connectors.	**Yes** INSTALL a new

• Check for:
  • corrosion
  • pushed-out pins
• Connect all instrument cluster connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

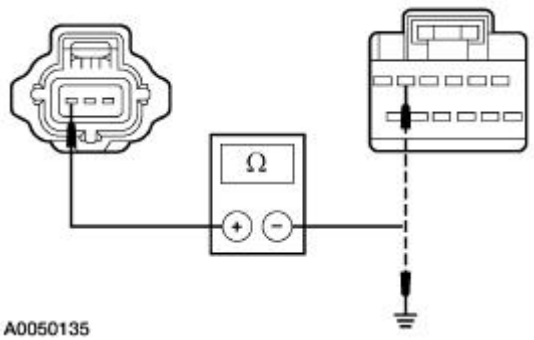
PINPOINT TEST D: INCORRECT TEMPERATURE GAUGE INDICATION

Test Step	Result / Action to Take
D1 CARRY OUT THE INSTRUMENT CLUSTER ENGINE COOLANT TEMPERATURE GAUGE ACTIVE COMMAND	
• Connect the diagnostic tool. • Key in ON position. • Enter the following diagnostic mode on the diagnostic tool: Instrument Cluster Active Command. • Trigger instrument cluster active command ENGCOOLNT. Monitor the engine coolant temperature gauge while adjusting the ENGCOOLNT active command to read 50% and 100%. • **Does the temperature gauge start at cold, move to half at 50%, and full hot at 100%?**	**Yes** REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual. **No** GO to D2.
D2 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	

• Disconnect all instrument cluster connectors.
• Check for:
  • corrosion
  • pushed-out pins
• Connect all instrument cluster connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST E: INCORRECT VOLTAGE GAUGE INDICATION—EXCEPT COBRA

Test Step	Result / Action to Take
E1 CHECK THE INSTRUMENT CLUSTER	

CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector. ● Connect the diagnostic tool. ● Key in ON position. ● Enter the following diagnostic mode on the diagnostic tool: Instrument Cluster Active Command. ● Trigger the instrument cluster voltage gauge active command. Scroll to 0%, 50%, and 100%. ● **Did the voltage gauge indicate L at 0%, the middle of the gauge at 50%, and H at 100%?**	**Yes** GO to E2 . **No** GO to E4 .
E2 CHECK CHARGING SYSTEM	
● Check the charging system operation. REFER to Section 414-00 . ● **Is the charging system operating correctly?**	**Yes** GO to E3 . **No** REPAIR the charging system as needed. REFER to Section 414-00 .
E3 CHECK CIRCUIT 904 (LG/RD) FOR OPEN OR SHORT TO GROUND	
● Key in OFF position. ● Disconnect: Instrument Cluster C220a. ● Disconnect: Generator C102a. ● Measure resistance between the generator C102a pin 1, circuit 904 (LG/RD), harness side and the instrument cluster C220a pin 5, circuit 904 (LG/RD), harness side; and between the generator C102a pin 1, circuit 904 (LG/RD), harness side and ground.  ● **Is the resistance less than 5 ohms between the generator and the instrument cluster; and greater than 10,000 ohms between the generator and ground?**	**Yes** The system is operating correctly at this time. **No** REPAIR the circuit. TEST the system for normal operation.
E4 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	

● Disconnect all instrument cluster connectors.
● Check for:
  ● corrosion
  ● pushed-out pins
● Connect all instrument cluster connectors and make sure they seat correctly.
● Operate the system and verify the concern is still present.
● **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs.

	REPEAT the self-test.

PINPOINT TEST F: INCORRECT TACHOMETER INDICATION

Test Step	Result / Action to Take
F1 CHECK THE TACHOMETER OPERATION	**Yes** REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual. **No** GO to F2 .
● Connect the diagnostic tool. ● Key in ON position. ● Enter the following diagnostic mode on the diagnostic tool: Instrument Cluster Active Command. ● Trigger the instrument cluster active command TCHOMETER. Scroll to 0%, 50%, and 100%. ● **Did the tachometer display read 0 at 0%, half the tachometer display at 50%, and the full tachometer display at 100%?**	
F2 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	**Yes** INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation. **No** The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

● Disconnect all instrument cluster connectors.
● Check for:
  ● corrosion
  ● pushed-out pins
● Connect all instrument cluster connectors and make sure they seat correctly.
● Operate the system and verify the concern is still present.
● **Is the concern still present?**	

PINPOINT TEST G: INCORRECT BOOST GAUGE INDICATION—COBRA ONLY

Test Step	Result / Action to Take
G1 CHECK BOOST GAUGE PRESSURE LINE	**Yes** CHECK for a plugged manifold fitting. TEST the system for normal operation. **No** GO to G2 .
● Disconnect the boost gauge pressure line from the intake manifold. ● Apply 69 kPa (10 psi) to the boost gauge pressure line. ● **Does the boost gauge indicate maximum boost pressure?**	
G2 CHECK THE BOOST GAUGE	**Yes** INSTALL a new boost gauge pressure line. TEST the system for normal operation. **No** INSTALL a new instrument cluster. REFER to
● Disconnect the boost gauge pressure line from the instrument cluster. ● Apply 10 psi to the boost gauge. ● **Does the boost gauge indicate maximum boost pressure?**	

	Instrument Cluster in this section. TEST the system for normal operation.

PINPOINT TEST H: THE LOW FUEL WARNING INDICATOR IS NEVER/ALWAYS ON

Test Step	Result / Action to Take
H1 CARRY OUT THE INSTRUMENT CLUSTER WARNING LAMPS AND CHIME ACTIVE COMMAND USING THE DIAGNOSTIC TOOL	
• Key in OFF position. • Connect the diagnostic tool. • Key in ON position. • Enter the following diagnostic mode on the diagnostic tool: Instrument Cluster Active Command. • Select the instrument cluster WARNING LAMPS AND CHIME active command. Trigger the ALL LAMPS active command. Observe the LOW FUEL warning indicator. • **Is the LOW FUEL warning indicator illuminating?**	**Yes** GO to H2 . **No** GO to H3 .
H2 THE LOW FUEL GAUGE WARNING INDICATOR IS NEVER/ALWAYS ON	
• Check the fuel gauge for correct operation. • **Is the fuel gauge operating correctly?**	**Yes** GO to H3 . **No** Go To Pinpoint Test B .
H3 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	

• Disconnect all instrument cluster connectors.
• Check for:
  ◦ corrosion
  ◦ pushed-out pins
• Connect all instrument cluster connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST I: THE SPEEDOMETER IS INOPERATIVE

Test Step	Result / Action to Take
I1 TEST THE INSTRUMENT CLUSTER	
• Carry out the instrument cluster self-diagnostic mode. • **Did the gauge sweep?**	**Yes** REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual. **No**

	GO to I2 .
I2 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	

• Disconnect all instrument cluster connectors.
• Check for:
  ◦ corrosion
  ◦ pushed-out pins
• Connect all instrument cluster connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

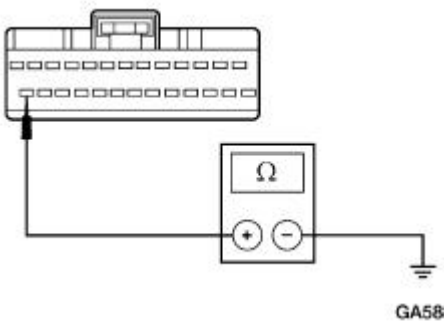
PINPOINT TEST J: THE ODOMETER IS INOPERATIVE

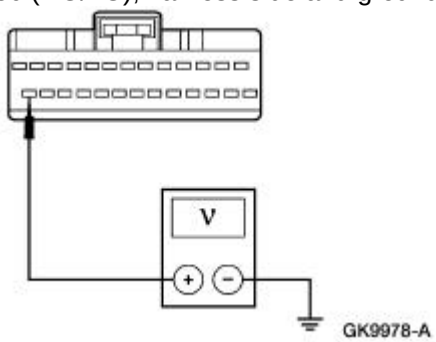
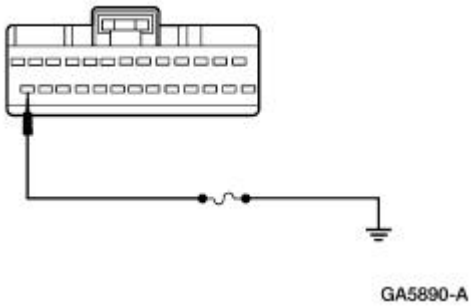
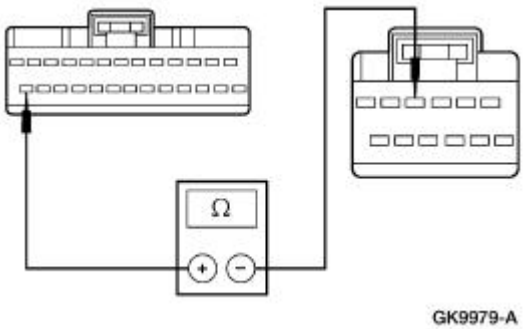
Test Step	Result / Action to Take
J1 CHECK THE ODOMETER DISPLAY	
• Key in ON position. • **Is the odometer displaying all dashes?**	**Yes** REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual. **No** GO to J2 .
J2 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	

• Disconnect all instrument cluster connectors.
• Check for:
  ◦ corrosion
  ◦ pushed-out pins
• Connect all instrument cluster connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST K: THE SAFETY BELT INDICATOR IS INOPERATIVE (CHIME IS OPERATIVE)/DOES NOT OPERATE CORRECTLY

Test Step	Result / Action to Take
K1 CHECK IF THE GEM IS RECEIVING THE CORRECT IGNITION SWITCH STATUS	
CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector. • Connect the diagnostic tool.	**Yes** GO to K2 . **No** REFER to Section 211-05 .

• Key in ON position. • Enter the following diagnostic mode on the diagnostic tool: Generic Electronic Module (GEM) PID. • Monitor the GEM PIDs IGN_KEY, IGN_S, IGN_R, and IGN_A, while inserting the ignition key and cycling the ignition switch through all the positions. • **Did the PIDs agree with the ignition switch positions?**	
K2 CHECK IF THE GEM IS RECEIVING THE CORRECT SAFETY BELT SWITCH STATUS	
• Monitor GEM PID D_SBELT while buckling and unbuckling the driver safety belt. • **Did the PID display IN with the safety belt buckled and OUT with the safety belt unbuckled?**	**Yes** GO to K3 . **No** REFER to Section 413-09 .
K3 CHECK THE GEM FOR INTERNAL OPEN OR SHORT	
• Key in OFF position. • Monitor the safety belt warning indicator when turning the ignition from the OFF to the ON position. • Key in ON position. • **Did the safety belt warning indicator illuminate for approximately three seconds and turn off?**	**Yes** GO to K10 . **No** GO to K4 .
K4 DETERMINE IF SAFETY BELT INDICATOR CIRCUIT IS SHORTED TO GROUND	
• Buckle the driver safety belt. • **Is the safety belt indicator always on?**	**Yes** GO to K5 . **No** GO to K7 .
K5 CHECK IF THE GEM IS INTERNALLY GROUNDED	
• Key in OFF position. • Disconnect: GEM C201e. • Key in ON position. • Observe the safety belt warning indicator. • **Is the safety belt warning indicator always on?**	**Yes** GO to K6 . **No** GO to K10 .
K6 CHECK CIRCUIT 450 (DG/LG) FOR A SHORT TO GROUND	
• Key in OFF position. • Disconnect: Instrument Cluster C220a. • Measure the resistance between the GEM C201e pin 26, circuit 450 (DG/LG), harness side and ground.  GA5889-A • **Is the resistance greater than 10,000 ohms?**	**Yes** GO to K11 . **No** REPAIR the circuit. TEST the system for normal operation.
K7 CHECK CIRCUIT 450 (DG/LG) FOR A SHORT TO BATTERY	
• Key in OFF position. • Disconnect: GEM C201e. • Disconnect: Instrument Cluster C220a.	**Yes** REPAIR the circuit. TEST the system for normal

• Measure the voltage between the GEM C201e pin 26, circuit 450 (DG/LG), harness side and ground.  • **Is any voltage present?**	operation. **No** GO to K8 .
K8 CHECK THE GEM MODULE FOR AN INTERNAL OPEN	
• Connect: Instrument Cluster C220a. • Install a fused (10A) jumper wire between the GEM C201e pin 26, circuit 450 (DG/LG), harness side and ground.  • Key in ON position. • **Did the safety belt indicator illuminate?**	**Yes** GO to K10 . **No** GO to K9 .
K9 CHECK CIRCUIT 450 (DG/LG) FOR AN OPEN	
• Key in OFF position. • Disconnect: Instrument Cluster C220a. • Measure the resistance between the GEM C201e pin 26, circuit 450 (DG/LG), harness side and instrument cluster C220a pin 4, circuit 450 (DG/LG), harness side.  • **Is the resistance less than 5 ohms?**	**Yes** GO to K11 . **No** REPAIR the circuit. TEST the system for normal operation.
K10 CHECK FOR CORRECT GEM OPERATION	

• Disconnect all GEM connectors.
• Check for:
  • corrosion
  • pushed-out pins
• Connect all GEM connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new GEM. REFER to Section 419-10 . TEST the system for normal operation.
	
	No
	The system is operating correctly at this time.

	Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

K11 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION
● Disconnect all instrument cluster connectors.
● Check for:
  ● corrosion
  ● pushed-out pins
● Connect all instrument cluster connectors and make sure they seat correctly.
● Operate the system and verify the concern is still present.
● **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST L: INACCURATE SPEEDOMETER READING

Test Step	Result / Action to Take
L1 CHECK SPEEDOMETER OPERATION ● Connect the diagnostic tool. ● Key in ON position. ● Enter the following diagnostic mode on the diagnostic tool: Instument Cluster Active Command. ● Trigger the instrument cluster active command SPDOMETER. Scroll to 0%, 50%, and 100%. ● **Did the speedometer display read 0 at 0%, half the speedometer display at 50%, and the full speedometer display at 100%?**	**Yes** REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual. **No** GO to L2 .

L2 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION
● Disconnect all instrument cluster connectors.
● Check for:
  ● corrosion
  ● pushed-out pins
● Connect all instrument cluster connectors and make sure they seat correctly.
● Operate the system and verify the concern is still present.
● **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST M: THE O/D OFF INDICATOR IS NEVER ON

Test Step	Result / Action to Take
M1 CHECK THE O/D OFF INDICATOR OPERATION	
• Key in ON position. • Observe the O/D OFF indicator. • **Is the O/D OFF indicator always on?**	**Yes** GO to M2 . **No** GO to M3 .
M2 CHECK THE INSTRUMENT CLUSTER	
• Key in OFF position. • Disconnect: Instrument Cluster C220a. • Key in ON position. • Observe the O/D OFF indicator. • **Did the indicator turn off?**	**Yes** REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual. **No** GO to M4 .
M3 CHECK THE INSTRUMENT CLUSTER OPERATION	
• Carry out the instrument cluster self-diagnostic mode. • **Did the O/D OFF indicator illuminate?**	**Yes** REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual. **No** GO to M4 .
M4 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	

• Disconnect all instrument cluster connectors.
• Check for:
  ◦ corrosion
  ◦ pushed-out pins
• Connect all instrument cluster connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST N: THE CHECK FUEL CAP INDICATOR IS NEVER ON

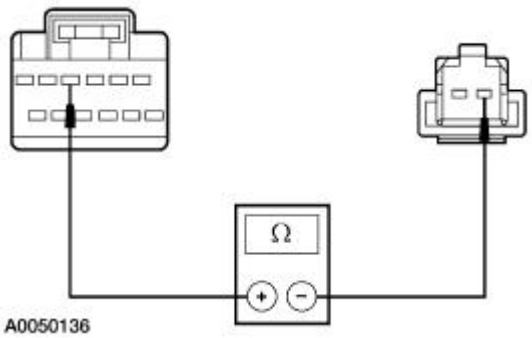
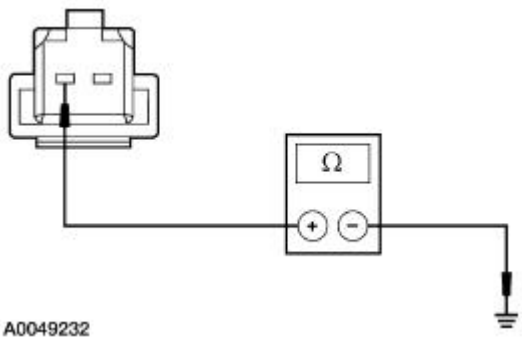
Test Step	Result / Action to Take
N1 RETREIVE AND RECORD DTCS FROM CONTINUOUS AND ON-DEMAND SELF-TESTS—PCM	
NOTE: Once the check fuel cap indicator does turn on, it does not turn off unless the fuel cap has been correctly secured and the vehicle has been driven for several minutes. • Use recorded PCM DTCs from the continuous and on-demand self-test. • **Are any DTCs recorded?**	**Yes** If PCM DTC P0457, REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual. **No** GO to N2 .
N2 CARRY OUT THE INSTRUMENT CLUSTER	

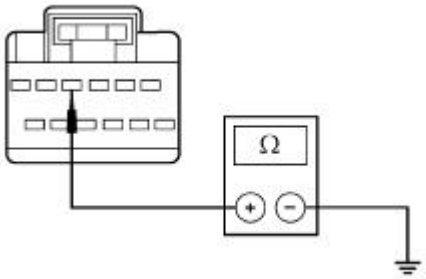
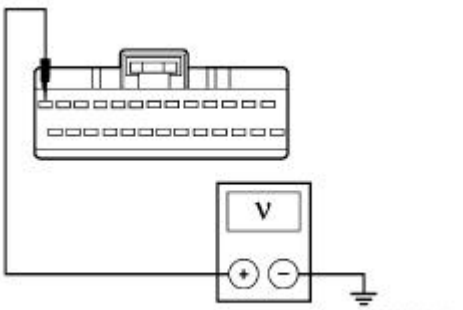
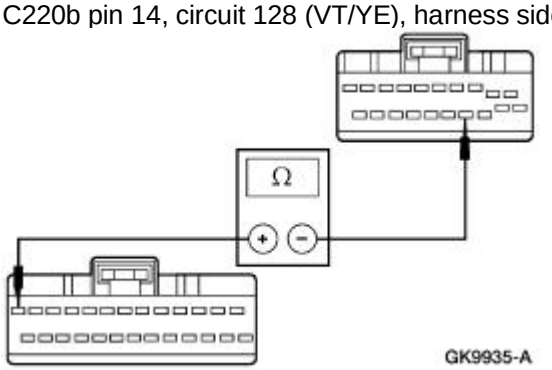
INDICATOR LAMP CONTROL III ACTIVE COMMAND USING THE DIAGNOSTIC TOOL	
• Connect the diagnostic tool. • Enter the following diagnostic mode on the diagnostic tool: Instrument Cluster Active Command. • Select the instrument cluster INDICATOR LAMP CONTROL III active command. Trigger the CHECK FUEL CAP active command ON. Observe the CHECK FUEL CAP indicator. • **Does the CHECK FUEL CAP indicator illuminate?**	**Yes** REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual. **No** GO to N3 .
N3 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	

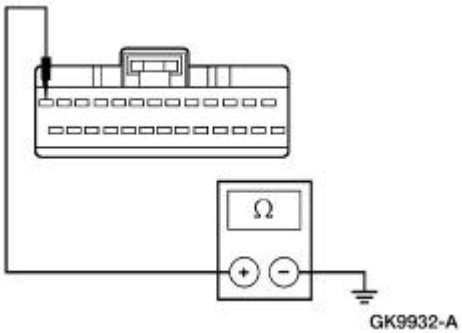
• Disconnect all instrument cluster connectors.
• Check for:
  • corrosion
  • pushed-out pins
• Connect all instrument cluster connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST O: THE BRAKE WARNING INDICATOR IS NEVER/ALWAYS ON

Test Step	Result / Action to Take
O1 CHECK IF THE GEM IS RECEIVING THE CORRECT IGNITION SWITCH STATUS	
CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector. • Connect the diagnostic tool. • Key in ON position. • Enter the following diagnostic mode on the diagnostic tool: Generic Electronic Module (GEM) PID. • Monitor GEM PIDs IGN_KEY, IGN_S, IGN_R, and IGN_A while cycling the ignition switch through all positions and then removing the key from ignition switch. • **Do the PIDs agree with the ignition switch status?**	**Yes** GO to O2 . **No** REFER to Section 211-05 .
O2 DETERMINE IF GEM IS RECEIVING THE CORRECT PARKING BRAKE INPUT	
• Monitor GEM PID PRK_BRK while applying and releasing the parking brake. • **Did the PID read ON with the parking brake applied, and OFF with the parking brake released?**	**Yes** GO to O3 . **No** GO to O5 .
O3 DETERMINE IF BRAKE WARNING INDICATOR CIRCUIT IS OPEN OR GROUNDED	
• Verify that the parking brake is released. • **Is the instrument cluster BRAKE warning indicator off?**	**Yes** GO to O4 .

	No GO to O11 .
O4 DETERMINE IF GEM IS SENDING THE CORRECT OUTPUT SIGNAL ● Trigger the GEM active command BKFLD LOW. ● **Did the instrument cluster BRAKE warning indicator illuminate?**	**Yes** GO to O14 . **No** GO to O9 .
O5 CHECK CIRCUIT BETWEEN THE PARKING BRAKE SWITCH AND THE GEM FOR A SHORT TO GROUND ● Monitor PID PRK_BRK while applying and releasing the parking brake. ● **Did the PID read ON with the parking brake applied and with the parking brake released?**	**Yes** GO to O8 . **No** GO to O6 .
O6 CHECK CIRCUIT 128 (VT/YE) AND CIRCUIT 22 (LB/BK) FOR AN OPEN ● Key in OFF position. ● Disconnect: Parking Brake Switch C306. ● Disconnect: GEM C201d. ● Measure the resistance between the GEM C201d pin 4, circuit 128 (VT/YE), harness side and the parking brake switch C306 pin 1, circuit 22 (LB/BK), harness side.  ● **Is the resistance less than 5 ohms?**	**Yes** GO to O7 . **No** REPAIR the circuit. TEST the system for normal operation.
O7 CHECK CIRCUIT 1205 (BK) FOR OPEN ● Measure the resistance between the parking brake switch C306 pin 2, circuit 1205 (BK), harness side and ground.  ● **Is the resistance less than 5 ohms?**	**Yes** INSTALL a new parking brake switch. TEST the system for normal operation. **No** REPAIR the circuit. TEST the system for normal operation.
O8 CHECK CIRCUIT 128 (VT/YE) FOR A SHORT TO GROUND ● Key in OFF position. ● Disconnect: Parking Brake Switch C306. ● Disconnect: GEM C201d. ● Measure the resistance between the GEM C201d pin 4, circuit 128 (VT/YE), harness side and ground.	**Yes** REPAIR or INSTALL a new parking brake switch as needed. TEST the system for normal operation.

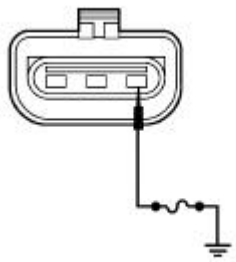
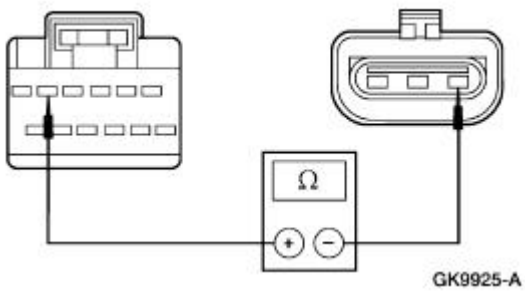
 GA5886-A ● **Is the resistance greater than 10,000 ohms?**	**No** REPAIR the circuit. TEST the system for normal operation.
O9 CHECK CIRCUIT 128 (VT/YE) FOR SHORT TO BATTERY ● Key in OFF position. ● Disconnect: GEM C201e. ● Disconnect: Instrument Cluster C220b. ● Key in ON position. ● Measure the voltage between the GEM C201e pin 13, circuit 128 (VT/YE), harness side and ground.  GK9933-A ● **Is any voltage indicated?**	**Yes** REPAIR the circuit. TEST the system for normal operation. **No** GO to O10 .
O10 CHECK CIRCUIT 128 (VT/YE) FOR AN OPEN ● Key in OFF position. ● Measure the resistance between the GEM C201e pin 13, circuit 128 (VT/YE), harness side and the instrument cluster C220b pin 14, circuit 128 (VT/YE), harness side.  GK9935-A ● **Is the resistance less than 5 ohms?**	**Yes** GO to O15 . **No** REPAIR the circuit. TEST the system for normal operation.
O11 CHECK THE BRAKE FLUID LEVEL SWITCH FOR AN INTERNAL GROUND ● Key in OFF position. ● Disconnect: Brake Fluid Level Switch C124. ● Key in ON position. ● With the parking brake released, observe the BRAKE warning indicator. ● **Is the BRAKE warning indicator always on?**	**Yes** GO to O12 . **No** INSTALL a new brake fluid level switch. TEST the system for normal operation.

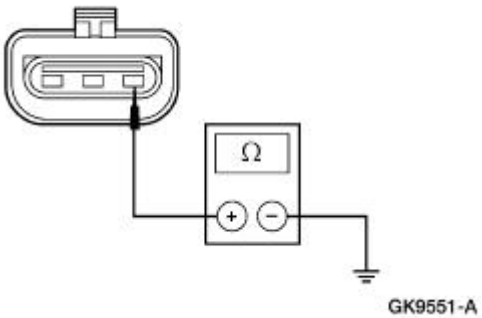
O12 DETERMINE IF THE GEM IS INTERNALLY GROUNDED • Key in OFF position. • Disconnect: GEM C201e. • Key in ON position. • Observe the BRAKE warning indicator. • **Is BRAKE warning indicator always on?**	**Yes** GO to O13 . **No** GO to O14 .
O13 CHECK CIRCUIT 128 (VT/YE) FOR SHORT TO GROUND BETWEEN GEM AND INSTRUMENT CLUSTER • Key in OFF position. • Disconnect: Instrument Cluster C220b. • Measure the resistance between the GEM C201e pin 13, circuit 128 (VT/YE), harness side and ground.  • **Is resistance greater than 10,000 ohms?**	**Yes** GO to O15 . **No** REPAIR the circuit. TEST the system for normal operation.

O14 CHECK FOR CORRECT GEM OPERATION
• Disconnect all GEM connectors.
• Check for:
  • corrosion
  • pushed-out pins
• Connect all GEM connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new GEM. REFER to Section 419-10 . TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

O15 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION
• Disconnect all instrument cluster connectors.
• Check for:
  • corrosion
  • pushed-out pins
• Connect all instrument cluster connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST P: THE CHARGING SYSTEM WARNING INDICATOR IS NEVER/ALWAYS ON

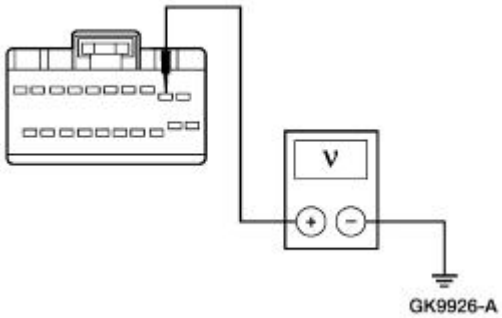
Test Step	Result / Action to Take
P1 CHECK THE CHARGING SYSTEM	**Yes** GO to P2 . **No** REFER to Section 414-00 .
CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector. ● Check the charging system operation. Refer to Section 414-00 . ● **Is the charging system operating correctly?**	
P2 CHECK CHARGING SYSTEM WARNING INDICATOR WITH ENGINE OFF	**Yes** GO to P5 . **No** GO to P3 .
● Key in ON position. ● Observe the charging system warning indicator. ● **Is the charging system warning indicator on?**	
P3 CHECK THE INSTRUMENT CLUSTER INPUT	**Yes** INSTALL a new generator. REFER to Section 414-02 . TEST the system for normal operation. **No** GO to P4 .
● Key in OFF position. ● Disconnect: Generator C102c. ● Connect a fused (10A) jumper wire between the generator C102c pin 1, circuit 904 (LG/RD), harness side and ground.  GK9549-A ● Key in ON position. ● **Does the charging system indicator illuminate?**	
P4 CHECK CIRCUIT 904 (LG/RD) FOR OPEN	**Yes** GO to P7 . **No** REPAIR the circuit. TEST the system for normal operation.
● Key in OFF position. ● Disconnect: Instrument Cluster C220a . ● Measure the resistance between the instrument cluster C220a pin 5, circuit 904 (LG/RD), harness side and the generator C102c pin 1, circuit 904 (LG/RD), harness side.  GK9925-A ● **Is the resistance less than 5 ohms?**	
P5 CHECK THE GENERATOR	

• Key in OFF position. • Disconnect: Generator C102c. • Key in ON position. • **Does the charging system indicator illuminate?**	**Yes** GO to P6 . **No** INSTALL a new generator. REFER to Section 414-02 . TEST the system for normal operation.
P6 CHECK CIRCUIT 904 (LG/RD) FOR SHORT TO GROUND	
• Key in OFF position. • Measure the resistance between the generator C102c pin 1, circuit 904 (LG/RD), harness side and ground.  • **Is the resistance greater than 10,000 ohms?**	**Yes** GO to P7 . **No** REPAIR the circuit. TEST the system for normal operation.
P7 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	

• Disconnect all instrument cluster connectors.
• Check for:
  • corrosion
  • pushed-out pins
• Connect all instrument cluster connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST Q: THE HIGH BEAM INDICATOR IS NEVER/ALWAYS ON

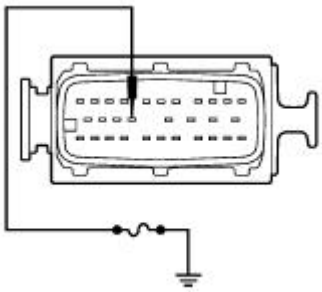
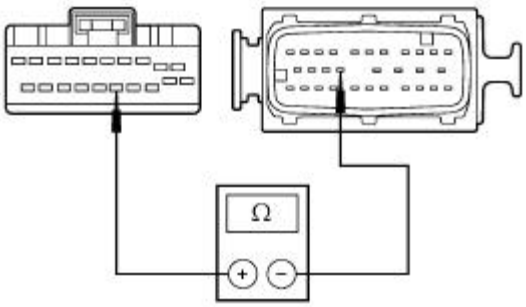
Test Step	Result / Action to Take
Q1 CHECK THE HIGH BEAM LAMP OPERATION	
CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector. • Key in ON position. • Operate the high beams. • **Do the high beams operate correctly?**	**Yes** GO to Q2 . **No** REFER to Section 417-01 .
Q2 CHECK CIRCUIT 932 (GY/WH) AND CIRCUIT 12 (LG/BK) FOR AN OPEN	

• Key in OFF position. • Disconnect: Instrument Cluster C220b. • Key in ON position. • Measure the voltage between the instrument cluster C220b pin 2, circuit 12 (LG/BK), harness side and ground, while turning the high beams on and off.  • **Is the voltage 0 volts with the high beams off and greater than 10 volts with the high beams on?**	**Yes** GO to Q3 . **No** REPAIR the circuit. TEST the system for normal operation.
Q3 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	

• Disconnect all instrument cluster connectors.
• Check for:
  • corrosion
  • pushed-out pins
• Connect all instrument cluster connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST R: THE ABS WARNING INDICATOR IS NEVER ON

Test Step	Result / Action to Take
R1 CHECK THE ABS WARNING INDICATOR OPERATION	
CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector. • Key in ON position. • Observe the ABS warning indicator. The ABS indicator should prove out for approximately six seconds then turn off. • **Does the ABS warning indicator operate correctly?**	**Yes** The system is operating normally at this time. **No** If the indicator is inoperative, GO to R2 . If the indicator is always on, REFER to Section 206-09A or Section 206-09B .
R2 CHECK THE INSTRUMENT CLUSTER INPUT	
• Key in OFF position. • Disconnect: Anti-Lock Brake Control Module C135. • Connect a fused (10A) jumper wire between the anti-lock brake control module C135 pin 16, circuit 603 (DG), harness	**Yes** REFER to Section 206-09A or Section 206-09B .

side and ground.  GK9972-A ● Key in ON position. ● **Does the ABS indicator illuminate?**	**No** GO to R3 .
R3 CHECK CIRCUIT 603 (DG) FOR AN OPEN	
● Key in OFF position. ● Disconnect: Instrument Cluster C220b. ● Measure the resistance between the instrument cluster C220b pin 15, circuit 603 (DG), harness side and the anti-lock brake control module C135 pin 16, circuit 603 (DG), harness side.  GK9973-A ● **Is the resistance less than 5 ohms?**	**Yes** GO to R4 . **No** REPAIR the circuit. TEST the system for normal operation.
R4 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	

● Disconnect all instrument cluster connectors.
● Check for:
  ● corrosion
  ● pushed-out pins
● Connect all instrument cluster connectors and make sure they seat correctly.
● Operate the system and verify the concern is still present.
● **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST S: THE SERVICE ENGINE SOON INDICATOR IS NEVER/ALWAYS ON

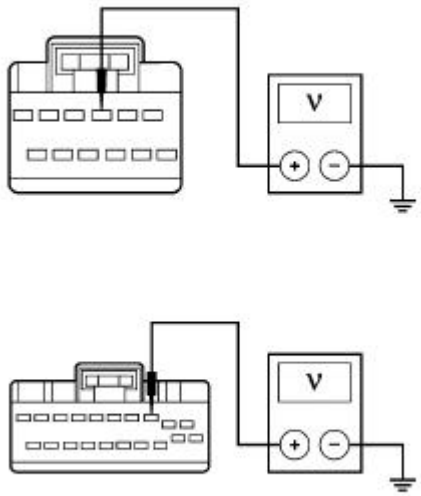
Test Step	Result / Action to Take
S1 CARRY OUT THE INSTRUMENT	

CLUSTER SERVICE ENGINE SOON INDICATOR ACTIVE COMMAND	
• Connect the diagnostic tool. • Key in ON position. • Enter the following diagnostic mode on the diagnostic tool: Instrument Cluster Active Command. • Trigger the instrument cluster active command MIL. • **Did the SERVICE ENGINE SOON indicator illuminate?**	**Yes** REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual. **No** GO to S2 .
S2 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	

• Disconnect all instrument cluster connectors.
• Check for:
  • corrosion
  • pushed-out pins
• Connect all instrument cluster connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST T: THE TURN/HAZARD INDICATOR IS NEVER/ALWAYS ON

Test Step	Result / Action to Take
T1 CHECK THE TURN SIGNAL AND HAZARD LAMPS OPERATION	
CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector. • Key in ON position. • Operate the left and right turn signals. • Operate the hazard lamps. • **Do the turn signals and hazard lamps operate correctly?**	**Yes** GO to T2 . **No** REFER to Section 417-01 .
T2 CHECK THE CIRCUIT IN QUESTION — CIRCUIT 2 (WH/LB) (RH) OR CIRCUIT 3 (LG/WH) (LH)	
• Key in OFF position. • Disconnect: Instrument Cluster C220a (RH) or C220b (LH). • Key in ON position. • Measure the voltage between the instrument cluster C220a pin 3, circuit 3 (LG/WH), harness side and ground, while the steering column multifunction switch is placed in the left turn position (LH); or between the instrument cluster C220b pin 3, circuit 2 (WH/LB), harness side and ground, while the steering column multifunction switch is placed in the right turn position (RH).	**Yes** GO to T3 . **No** REPAIR the circuit (s) in question. TEST the system for normal operation.

 GK9927-A ● **Does the voltage alternate between 0 volts and 10 volts with the turn signal on?**	
T3 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	

● Disconnect all instrument cluster connectors.
● Check for:
  ● corrosion
  ● pushed-out pins
● Connect all instrument cluster connectors and make sure they seat correctly.
● Operate the system and verify the concern is still present.
● **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

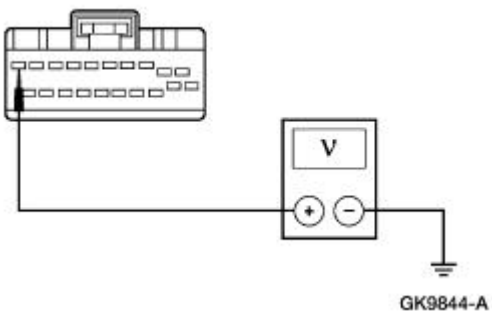
PINPOINT TEST U: THE TRACTION CONTROL INDICATOR IS NEVER/ALWAYS ON

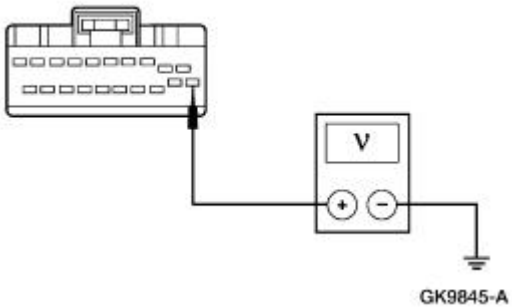
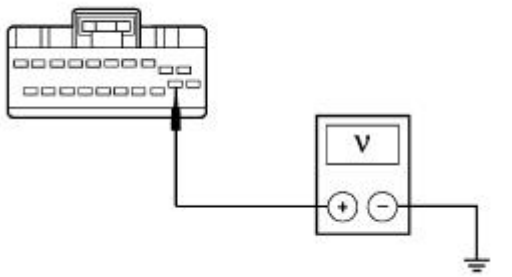
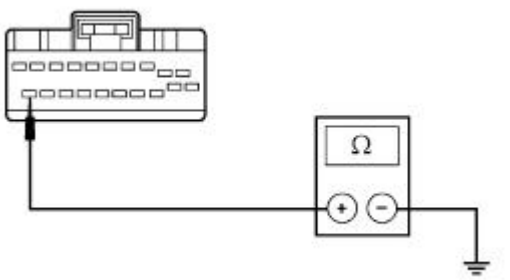
Test Step	Result / Action to Take
U1 DETERMINE IF THE TRACTION CONTROL INDICATOR IS ALWAYS ON	
● Observe the traction control indicator. ● **Is the indicator always on?**	**Yes** REFER to Section 206-09B . **No**

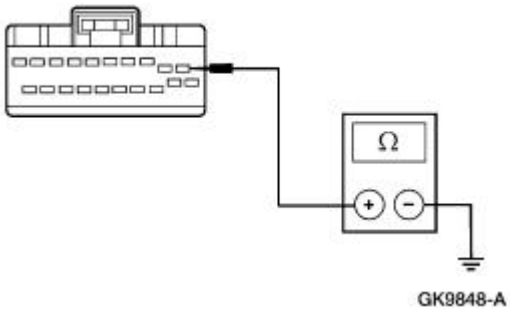
	GO to U2 .
U2 DETERMINE IF INSTRUMENT CLUSTER IS AT FAULT	
• Connect the diagnostic tool. • Key in ON position. • Enter the following diagnostic mode on the diagnostic tool: Instrument Cluster Active Command. • Trigger the instrument cluster active command TRAC OFF. • **Did the traction control indicator illuminate?**	**Yes** REFER to Section 206-09B . **No** GO to U3 .
U3 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	

• Disconnect all instrument cluster connectors.
• Check for:
  ◦ corrosion
  ◦ pushed-out pins
• Connect all instrument cluster connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST V: THE INSTRUMENT CLUSTER IS INOPERATIVE

Test Step	Result / Action to Take
V1 CHECK THE BATTERY POWER SUPPLY TO THE INSTRUMENT CLUSTER	
CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector. • Key in OFF position. • Disconnect: Instrument Cluster C220b. • Measure voltage between the instrument cluster C220b pin 10, circuit 729 (RD/WH), harness side and ground.  • **Is the voltage greater than 10 volts?**	**Yes** GO to V2 . **No** REPAIR the circuit. TEST the system for normal operation.
V2 CHECK THE RUN POWER SUPPLY TO THE INSTRUMENT CLUSTER	
• Key in ON position. • Measure the voltage between the instrument cluster C220b pin 11, circuit 489 (PK/BK), harness side and ground.	**Yes** GO to V3 .

 GK9845-A ● **Is the voltage greater than 10 volts?**	**No** REPAIR the circuit. TEST the system for normal operation.
V3 CHECK RUN/START POWER SUPPLY TO THE INSTRUMENT CLUSTER ● Key in OFF position. ● Disconnect: Instrument Cluster C220b. ● Key in ON position. ● Measure the voltage between the instrument cluster C220b pin 12, circuit 20 (WH/LB), harness side and ground.  GK9846-A ● **Is the voltage greater than 10 volts?**	**Yes** GO to V4 . **No** REPAIR the circuit. TEST the system for normal operation.
V4 CHECK GROUND CIRCUIT 397 (BK/WH) FOR AN OPEN ● Key in OFF position. ● Measure the resistance between the instrument cluster C220b pin 20, circuit 397 (BK/WH), harness side and ground.  GK9847-A ● **Is the resistance less than 5 ohms?**	**Yes** GO to V5 . **No** REPAIR the circuit. TEST the system for normal operation.
V5 CHECK GROUND CIRCUIT 1205 (BK) FOR OPEN ● Measure the resistance between the instrument cluster C220b pin 1, circuit 1205 (BK), harness side and ground.	**Yes** GO to V6 . **No** REPAIR the circuit. TEST the system for normal operation.



- **Is the resistance less than 5 ohms?**

V6 CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	

• Disconnect all instrument cluster connectors.
• Check for:
  • corrosion
  • pushed-out pins
• Connect all instrument cluster connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

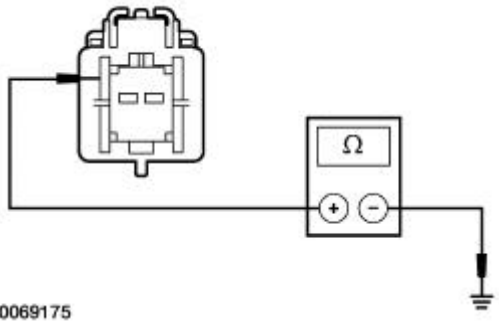
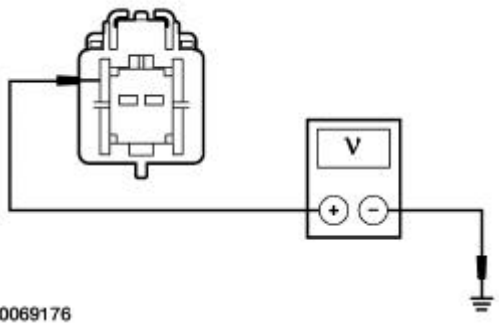
PINPOINT TEST W: NO COMMUNICATION WITH THE GENERIC ELECTRONIC MODULE (GEM)

Test Step	Result / Action to Take
CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.	
W1 CHECK THE GENERIC ELECTRONIC MODULE (GEM) POWER SUPPLY	
• Key in OFF position. • Disconnect: Generic Electronic Module (GEM) C201a. • Disconnect: GEM C201b. • Key in ON position. • Using the following table, measure the voltage between the GEM, harness side and ground.	**Yes** GO to W2 . **No** REPAIR the circuit(s) in question. TEST the system for normal operation.

Connector	Pin	Circuit
C201a	4	400 (LB/BKK)
C201a	1	1006 (DG/WH)
C201b	2	1001 (WH/YE)
C201b	3	193 (YE/LG)

- **Are the voltages greater than 10 volts?**

W2 CHECK THE GEM GROUND CIRCUIT 397 (BK/WH) FOR	

OPEN	
• Key in OFF position. • Measure the resistance between the GEM C201b pin 4, circuit 397 (BK/WH), harness side and ground.  A0069175 • **Is the resistance less than 5 ohms?**	**Yes** GO to W3 . **No** REPAIR the circuit(s) in question. TEST the system for normal operation.
W3 CHECK CIRCUIT 397 (BK/WH) FOR SHORT TO POWER	
• Measure the voltage between the GEM C201b pin 4, circuit 397 (BK/WH), harness side and ground.  A0069176 • **Is any voltage present?**	**Yes** REPAIR the circuit. TEST the system for normal operation. **No** REFER to Section 418-00 .

Instrument Cluster

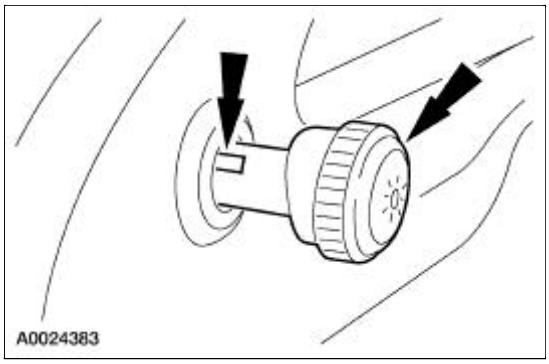
Removal and Installation

All vehicles

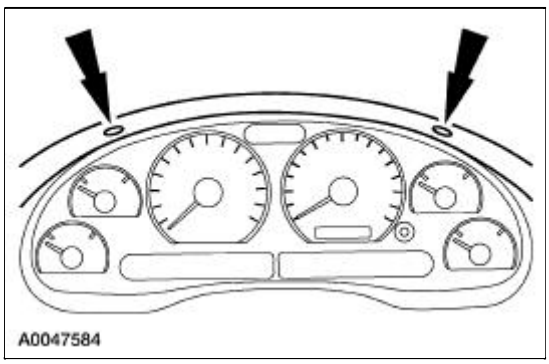
1. **CAUTION: Electronic modules are sensitive to electrical charges. If exposed to these charges, damage may result.**

   Disconnect the battery ground cable. For additional information, refer to Section 414-01 .

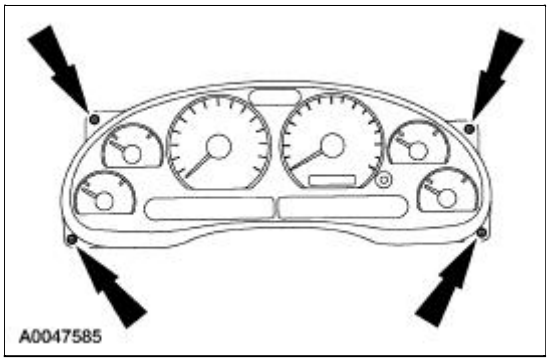
2. Remove the headlamp switch knob.
   - Pull out the headlamp switch knob and insert a thin tool in the slot to release the knob from the shaft.



3. Remove the screws and remove the instrument cluster finish panel.

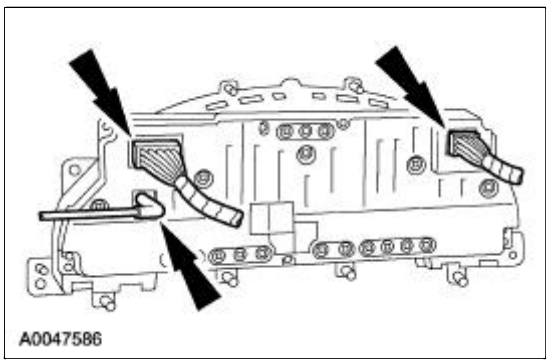


4. Remove the screws and pull the instrument cluster forward to expose the electrical connector.



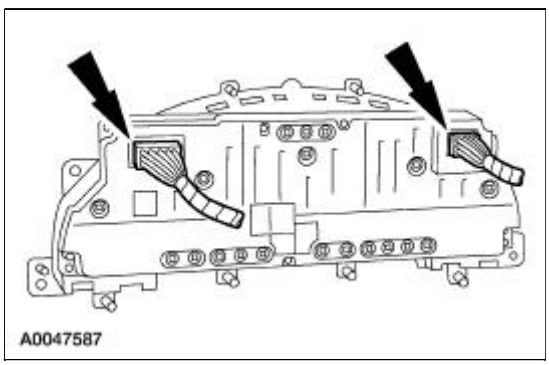
Cobra only

5. Disconnect the electrical connectors and boost pressure line and remove the instrument cluster.



Except Cobra

6. Disconnect the electrical connectors and remove the instrument cluster.



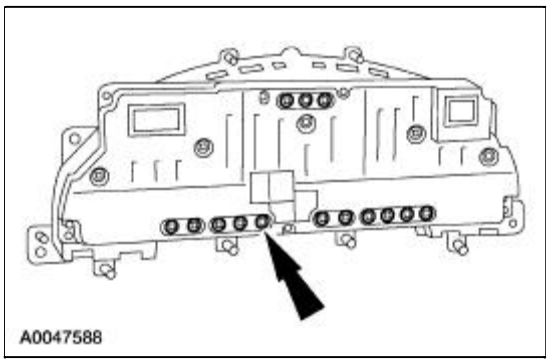
All vehicles

7. To install, reverse the removal procedure.

Warning Indicator Bulb

Removal and Installation

1. Remove the instrument cluster. Refer to Instrument Cluster in this section.
2. Remove the necessary instrument cluster bulbs by rotating one quarter turn counterclockwise.

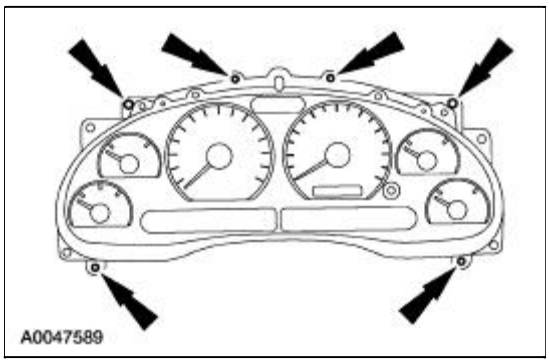


3. To install, reverse the removal procedure.

Instrument Cluster Lens

Removal and Installation

1. Remove the instrument cluster. Refer to Instrument Cluster in this section.
2. Remove the screws and remove the instrument cluster lens.



3. To install, reverse the removal procedure.

Torque Specifications

Description	Nm	lb-ft	lb-in
Horn retaining screw	10	—	89
Horn switch retaining bolts	5	—	40
Driver side air bag module retaining screws	12	9	—

Horn

The horn system consists of the following:

- dual horns (one high-pitched, one low-pitched)
- horn switch (located underneath the driver side air bag module [043B13]).
- horn relay (located in the central junction box [CJB]).

Horn

Refer to Wiring Diagrams Cell 44 , Horns/Cigar Lighter for schematic and connector information.

Special Tool(s)

ST1137-A	73 Digital Multimeter or equivalent 105-R0051

Inspection and Verification

1. Verify the customer concern by operating the horn (13832).
2. Visually inspect for obvious signs of mechanical and electrical damage.

Visual Inspection Chart

Mechanical	Electrical
● Damaged horns ● Damaged horn switch ● Damaged air bag sliding contact (14A664)	● Blown battery junction box (BJB) Fuse Horn Relay (20A) ● Damaged wiring harness ● Damaged connections ● Damaged horn relay ● Damaged horn switch

3. If fault is not visually evident, determine the symptom and proceed to Symptom Chart.

Symptom Chart

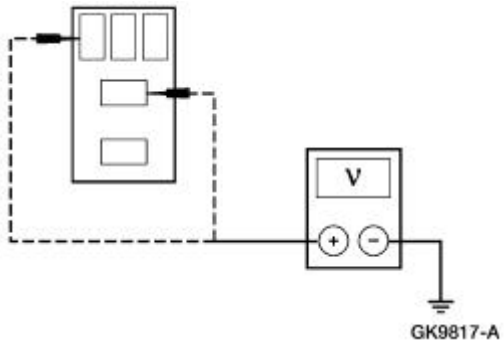
Symptom Chart

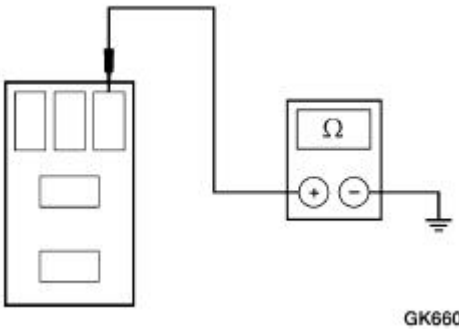
Condition	Possible Sources	Action
● The horn does not sound	● BJB Fuse Horn Relay (20A). ● Circuitry. ● Horn relay. ● Air bag sliding contact. ● Horn switch. ● Horns.	● GO to Pinpoint Test A .
● The horn sounds continuously	● Circuitry. ● Horn relay. ● Remote entry system (generic electronic module [GEM])	● GO to Pinpoint Test B .

	module. ● Horn switch.	

Pinpoint Tests

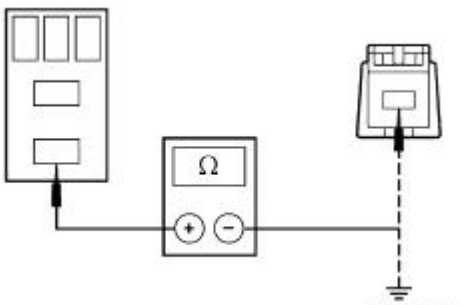
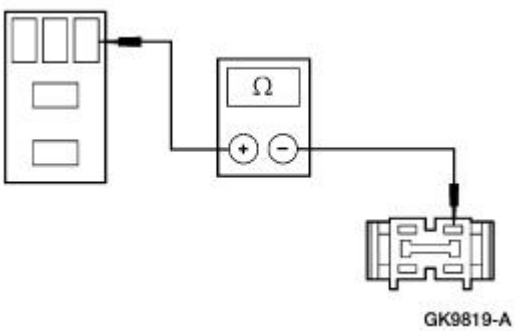
PINPOINT TEST A: THE HORN DOES NOT SOUND

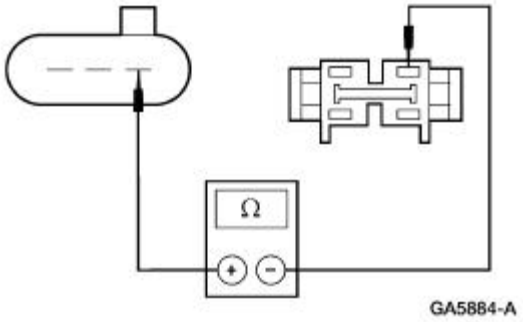
Test Step	Result / Action to Take
A1 CHECK POWER SUPPLY TO HORN RELAY	
● Disconnect: Horn Relay. ● Measure the voltage between the horn relay connector Pin 2, Circuit 460 (YE/LB), harness side and ground; and between the horn relay connector Pin 5, Circuit 460 (YE/LB), harness side and ground.  ● **Are the voltages greater than 10 volts?**	**Yes** GO to A2 . **No** REPAIR the circuit in question. TEST the system for normal operation.
A2 CHECK HORN RELAY	
● Check the horn relay; refer to Wiring Diagrams Cell 149. ● **Is the horn relay OK?**	**Yes** GO to A3 . **No** INSTALL a new horn relay. TEST the system for normal operation.
A3 CHECK HORN SWITCH SIGNAL TO HORN RELAY	
● Measure the resistance between horn relay connector Pin 1, Circuit 6 (YE/LG), harness side and ground under the following conditions: **Horn Switch Position** **Horn Switch Position** / **Resistance** Pressed / Less than 5 ohms Released / Greater than 10,000 ohms	**Yes** GO to A4 . **No** GO to A5 .



GK6602-A

- **Are the resistances correct?**

A4 CHECK WIRE BETWEEN HORN RELAY AND HORN	
• Key in OFF position. • Disconnect: Horn C1262. • Disconnect: Horn C1261. • Measure the resistance between the horn relay connector Pin 3, Circuit 1 (DB), harness side and horn C1261 or horn C1256 harness side; and between the horn relay connector Pin 3, Circuit 1 (DB), harness side and ground.  GK9818-A • **Is the resistance less than 5 ohms between the horn relay and the horns, and greater than 10,000 ohms between the horn relay and ground?**	**Yes** INSTALL new horns. TEST the system for normal operation. **No** REPAIR the circuit. TEST the system for normal operation.
A5 CHECK WIRE BETWEEN HORN RELAY AND AIR BAG SLIDING CONTACT	
• Key in OFF position. • Deactivate the air bag system; refer to Section 501-20B . • Disconnect: Air Bag Sliding Contact C218a. • Measure the resistance between air bag sliding contact C218a Pin 2, Circuit 6 (YE/LG), harness side and horn relay connector Pin 1, Circuit 6 (YE/LG) harness side.  GK9819-A • **Is the resistance less than 5 ohms?**	**Yes** GO to A6 . **No** REPAIR the circuit. TEST the system for normal operation.
A6 CHECK AIR BAG SLIDING CONTACT	
• Disconnect the steering wheel switch harness from the air bag sliding contact. • Measure the resistance between upper air bag sliding contact	**Yes** GO to A7 .

connector Pin 3, Circuit 6 (component side), and air bag sliding contact C218a Pin 2, Circuit 6 (component side).  ● **Is the resistance less than 5 ohms?**	**No** INSTALL a new air bag sliding contact. REFER to Section 501-20B . TEST the system for normal operation.
A7 CHECK THE STEERING WHEEL SWITCH HARNESS	
● Inspect the steering wheel switch harness for chafing, opens or possible short to ground. ● **Is the steering wheel switch harness OK?**	**Yes** INSTALL a new horn switch. REFER to Switch—Horn . TEST the system for normal operation. **No** INSTALL a new steering wheel switch harness. TEST the system for normal operation.

PINPOINT TEST B: THE HORN SOUNDS CONTINUOUSLY

Test Step	Result / Action to Take
B1 CHECK HORN CIRCUIT 1 (DB)	
● Key in OFF position. ● Disconnect: Horn Relay. ● **Does the horn continue to sound?**	**Yes** REPAIR Circuit 1 (DB) for short to battery. TEST the system for normal operation. **No** GO to B2 .
B2 CHECK HORN RELAY	
● Check the horn relay; refer to Wiring Diagrams Cell 149. ● **Is the horn relay OK?**	**Yes** REINSTALL the horn relay. GO to B3 . **No** INSTALL a new horn relay. TEST the system for normal operation.
B3 CHECK CIRCUIT 6 (YE/LG)	
● Disconnect: Air Bag Sliding Contact C218a . ● **Does the horn continue to sound?**	**Yes** GO to B4 . **No** RECONNECT the air bag sliding contact. GO to B5 .
B4 CHECK GEM INPUT	
● Disconnect: GEM C201e.	**Yes**

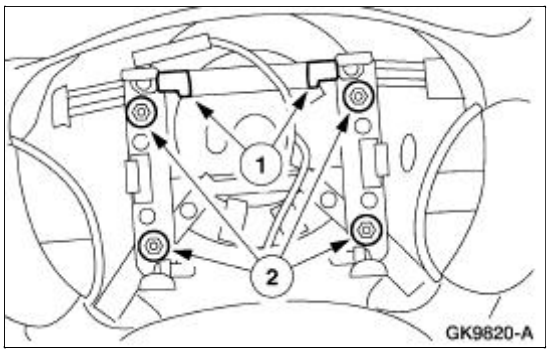
• **Does the horn continue to sound?**	REPAIR Circuit 6 (YE/LG). TEST the system for normal operation. **No** INSTALL a new GEM; REFER to Section 419-10 . TEST the system for normal operation.
B5 CHECK THE AIR BAG SLIDING CONTACT	**Yes** INSTALL a new air bag sliding contact. REFER to Section 501-20B . TEST the system for normal operation. **No** GO to B6 .
• Deactivate the air bag system. Refer to Section 501-20B . • Disconnect the steering wheel switch harness from the air bag sliding contact. • **Does the horn continue to sound?**	
B6 CHECK STEERING WHEEL SWITCH HARNESS	**Yes** INSTALL a new horn switch. REFER to Switch—Horn . TEST the system for normal operation. **No** INSTALL a new steering wheel switch harness. TEST the system for normal operation.
• Inspect the steering wheel switch harness for shorts, opens, or any damage. • **Is the steering wheel switch harness OK?**	

Switch —Horn

Removal

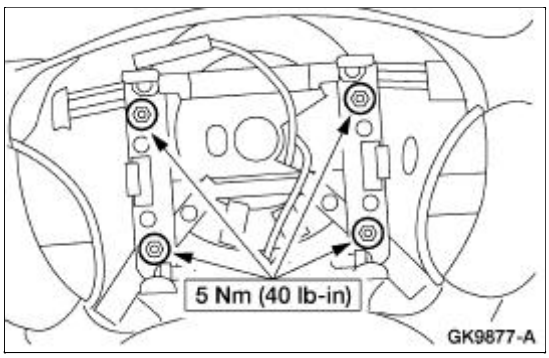
1. Remove the driver side air bag module (043B13). Refer to Section 501-20B .

2. Remove the switches.
    1. Disconnect the horn wire from the switches.
    2. Remove the horn switch screws and remove the switches.



Installation

1. To install, reverse the removal procedure.
    - Prove out the air bag system. Refer to Section 501-20B .



Warning Devices

The warning device system consists of the following components:

- door ajar switches
- generic electronic module (GEM)
- key-in-ignition warning switch
- safety belt switch
- parklamp switch

Gauges And Warning Devices

Refer to Wiring Diagrams Cell 59 , Generic Electronic Module for schematic and connector information.

Refer to Wiring Diagrams Cell 60 , Instrument Cluster for schematic and connector information.

Refer to Wiring Diagrams Cell 66 , Warning Chime for schematic and connector information.

Special Tool(s)

ST1137-A	73III Automotive Meter 105-R0057 or equivalent
ST2332-A	Worldwide Diagnostic System (WDS) 418-F224, New Generation STAR (NGS) Tester 418-F048, or equivalent diagnostic tool

Principles of Operation

Key-In-Ignition Warning Chime

The key-in-ignition warning chime activates when the generic electronic module (GEM) detects the ignition switch circuits are in the OFF or ACC states and when the GEM detects the driver door is ajar from the driver door ajar circuits. Refer to the Chime Duration Table in this section for audible output, duration time, and priority ratings.

Airbag Warning Chime

The airbag warning chime activates when the GEM detects the ignition switch circuits are in the RUN state and when the GEM detects a chime is requested from the airbag system circuit. Refer to the Chime Duration Table for audible output, duration time, and priority ratings.

Door Ajar Warning Chime

The door ajar warning chime activates when the GEM detects the ignition switch circuits are in the RUN state and when the GEM detects the driver or passenger door is ajar from the driver and passenger door ajar circuits. Refer to the Chime Duration Table in this section for audible output, duration time, and priority ratings.

Headlamps Left on Warning Chime

The headlamps left on warning chime activates when the GEM detects the ignition switch circuits are in the KEYOUT state, when the GEM detects the driver door is ajar from the driver door ajar circuit,

and when the GEM detects the headlamps or parklamps are on from the exterior lamp circuits. Refer to the Chime Duration Table in this section for audible output, duration time, and priority ratings.

Safety Belt Warning Chime

The safety belt warning chime and safety belt warning lamp activate when the GEM detects the ignition switch circuits are in the RUN or START state and when the GEM detects the safety belt is unbuckled from the safety belt circuit. The safety belt warning lamp indicator will prove out for three seconds whenever the GEM detects that the ignition circuits make a transition to RUN from OFF, ACC, or KEYOUT state. Refer to the Chime Duration Table in this section for audible output, duration time, and priority ratings.

Belt Minder

NOTE: Belt minder is a configurable item. If configuring using a diagnostic tool, refer to Section 418-01 . To configure without using a diagnostic tool, refer to Belt Minder Deactivating/Activating in this section.

The belt minder feature supplements the current safety belt warning function. The belt minder feature is enabled after the current safety belt warning is complete. If the driver safety belt is not buckled approximately five seconds after the safety belt warning light has turned off, the belt minder reminds the driver that their safety belt is unbuckled by intermittently sound a chime and illuminating the safety belt warning lamp in the instrument cluster. While activated, the belt minder alternates the chime and indicator from on for six seconds to off for 30 seconds.

The belt minder reminder stops when:

- the drive seat belt is buckled.
- the ignition is turned to OFF or ACC.
- five minutes have elapsed since belt minder has started.

Chime Duration Table

Feature	Audible Output	Duration	Priority
Safety belt	Chime, 60/minute 740 Hz	6.0 seconds	1
Key-in-ignition	Chime, 120/minute 740 Hz	Continuous	2
Headlamps left on	Chime, 240/minute 740 Hz	Continuous	3
Airbag	Single tone, 1,000 Hz	Continuous	4
Door ajar	Single tone, 1,000 Hz	1.0 second	7

Inspection and Verification

NOTE: Upon installation of a new GEM, the module must be reconfigured. For additional information, refer to Section 418-01 .

1. The warning lamps are a GEM controlled system; refer to Section 419-10 .
2. Verify the customer concern by operating the system in question.
3. Visually inspect for the following obvious signs of mechanical and electrical damage.

Visual Inspection Chart

Mechanical	Electrical
● Switch(es)	● Central junction box (CJB) fuses: ■ 28 (15A) ■ 32 (15A) ■ 39 (5A) ● Circuitry

4. If the concern remains after the inspection, connect the diagnostic tool to the data link connector (DLC) located beneath the instrument panel and select the vehicle to be tested from the diagnostic tool menu. If the diagnostic tool does not communicate with the vehicle:
   - check that the program card is correctly installed.
   - check the connections to the vehicle.
   - check the ignition switch position.

5. If the diagnostic tool still does not communicate with the vehicle, refer to the diagnostic tool manual.

6. Carry out the Data Link Diagnostic Test. If the diagnostic tool responds with:
   - CKT914, CKT915 or CKT70 = ALL ECUS NO RESP/NOT EQUIP, refer to Section 418-00 .
   - NO RESP/NOT EQUIP for GEM, go to Pinpoint Test A.
   - NO RESP/NOT EQUIP for RCM, refer to Section 501-20B .
   - SYSTEM PASSED, retrieve and record the continuous diagnostic trouble codes (DTCs), erase the continuous DTCs and carry out self-test diagnostics for the GEM.

7. If the DTCs retrieved are related to the concern, go to the GEM Diagnostic Trouble Code (DTC) Index to continue diagnostics.

8. If no DTCs related to the concern are retrieved, proceed to the Symptom Chart to continue diagnostics.

9. If the DTCs retrieved are for the RCM, refer to Section 501-20B .

GEM Diagnostic Trouble Code (DTC) Index

DTC	Description	Source	Action
B1340	Chime Input Request Circuit Short to Ground	GEM	Go To Pinpoint Test C .
B1342	ECU Is Defective	GEM	CLEAR the DTCs. TEST the system for normal operation. RETRIEVE the DTCs. If DTC B1342 is retrieved, INSTALL a new GEM. REFER to Section 419-10 .
B1353	Ignition Key-In Circuit Open	GEM	Go To Pinpoint Test B .
B1462	Safety Belt Switch Circuit Failure	GEM	Go To Pinpoint Test F .

Symptom Chart

Symptom Chart

Condition	Possible Sources	Action

• No communication with the generic electronic module (GEM)	• Central junction box (CJB) fuses:
	  ■ 39 (5A).
	  ■ 32 (15A).
	• Circuitry.
	• Generic electronic module (GEM).
		• Go To Pinpoint Test A .

• The key-in-ignition chime does not operate correctly	• Central junction box (CJB) fuses:
	  ■ 28 (15A).
	  ■ 32 (15A).
	• Central junction box (CJB).
	• Driver door ajar switch.
	• Key-in ignition switch.
	• Circuitry.
	• Generic electronic module (GEM).
	• Ignition switch.
		• Go To Pinpoint Test B .

• A chime does not operate correctly—air bag	• Restraint control module (RCM). • Circuitry. • Generic electronic module (GEM). • Ignition switch.	• Go To Pinpoint Test C .
• The door ajar chime does not operate correctly	• Driver door ajar switch. • Passenger door ajar switch. • Circuitry. • Generic electronic module (GEM). • Ignition switch.	• Go To Pinpoint Test D .
• The headlamp on reminder chime does not operate correctly	• Headlamp switch . • Circuitry. • Generic electronic module (GEM). • Driver door ajar switch. • Ignition switch.	• Go To Pinpoint Test E .
• The safety belt warning chime does not operate correctly	• Circuitry. • Safety belt switch. • Generic electronic module (GEM). • Ignition switch.	• Go To Pinpoint Test F .
• The belt minder feature does not operate correctly	• Circuitry. • Safety belt switch. • Generic electronic module (GEM). • Ignition switch.	• Go To Pinpoint Test F .

Pinpoint Tests

CAUTION: Before removing and installing the generic electronic module (GEM) or its connectors, disconnect the battery. Failure to follow this caution will result in the GEM storing many erroneous DTCs, and it may exhibit erratic operation after installation.

CAUTION: Be careful when probing the central junction box (CJB), or any connectors. Damage will result to the connector receptacle if the probe or terminal used is too large.

CAUTION: Electronic modules are sensitive to static discharges. If exposed to these charges, damage may result.

NOTE: If continuous DTCs are recorded and the symptom is not present when carrying out the pinpoint tests, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Complete the entire pinpoint test related to the symptom before installing a new GEM.

PINPOINT TEST A: NO COMMUNICATION WITH THE GENERIC ELECTRONIC MODULE (GEM)

<table>
<tr><th>Test Step</th><th>Result / Action to Take</th></tr>
<tr><td>A1 CHECK THE GENERIC ELECTRONIC MODULE (GEM) POWER SUPPLY</td><td rowspan="2">Yes
GO to A2 .

No
REPAIR the circuit(s) in question. TEST the system for normal operation.</td></tr>
<tr><td>

Key in OFF position.
Disconnect: Generic Electronic Module (GEM) C201a.
Disconnect: GEM C201b.
Key in ON position.
Using the following table, measure the voltage between the GEM, harness side and ground.

<table>
<tr><th>Connector</th><th>Pin</th><th>Circuit</th></tr>
<tr><td>C201a</td><td>4</td><td>400 (LB/BK)</td></tr>
<tr><td>C201a</td><td>1</td><td>1006 (DG/WH)</td></tr>
<tr><td>C201b</td><td>2</td><td>1001 (WH/YE)</td></tr>
<tr><td>C201b</td><td>3</td><td>193 (YE/LG)</td></tr>
</table>

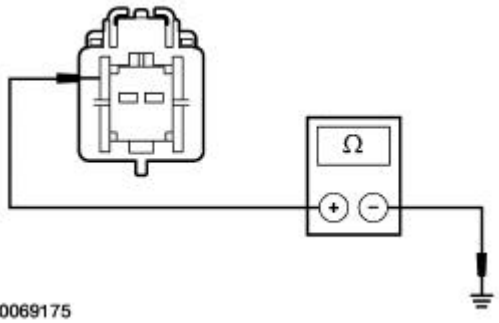
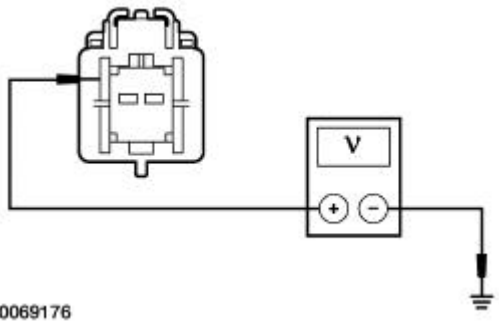
Are the voltages greater than 10 volts?

</td></tr>
<tr><td>A2 CHECK THE GEM GROUND CIRCUIT 397 (BK/WH) FOR OPEN</td><td rowspan="2">Yes
GO to A3 .

No
REPAIR the circuit(s) in question. TEST the system for normal operation.</td></tr>
<tr><td>

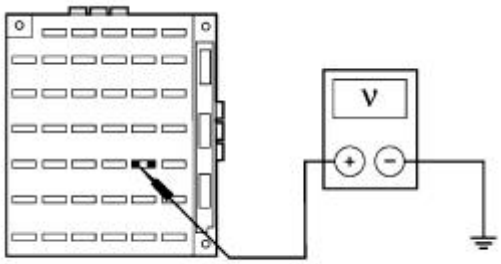
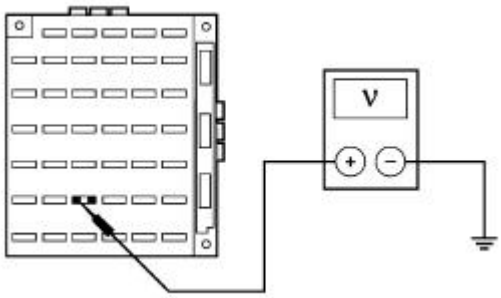
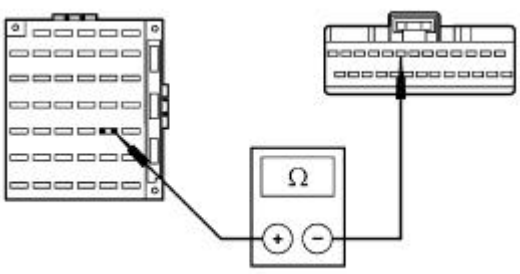
Key in OFF position.
Measure the resistance between the GEM C201b pin 4, circuit 397 (BK/WH), harness side and ground.

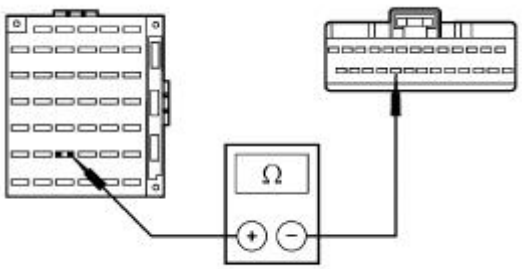
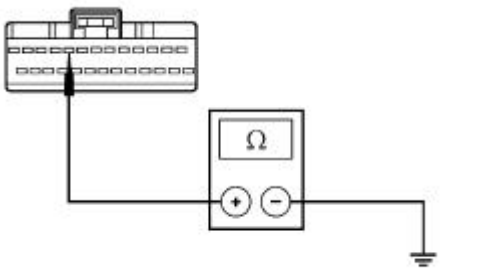
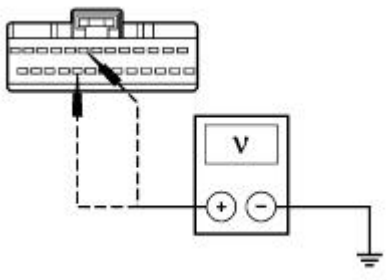
</td></tr>
</table>

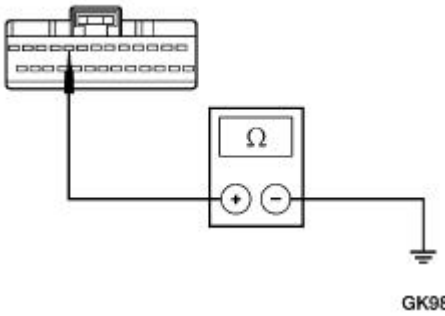
 A0069175 ● **Is the resistance less than 5 ohms?**	
A3 CHECK CIRCUIT 397 (BK/WH) FOR SHORT TO POWER	**Yes** REPAIR the circuit. TEST the system for normal operation. **No** REFER to Section 418-00 .
● Measure the voltage between the GEM C201b pin 4, circuit 397 (BK/WH), harness side and ground.  A0069176 ● **Is any voltage present?**	

PINPOINT TEST B: THE KEY-IN-IGNITION CHIME DOES NOT OPERATE CORRECTLY

Test Step	Result / Action to Take
B1 CHECK IGNITION STATES	**Yes** GO to B2 . **No** GO to B4 .
● Connect the diagnostic tool. ● Enter the following diagnostic mode on the diagnostic tool: GEM PID. ● Monitor the GEM PIDS IGN_KEY, IGN_A, IGN_S, and IGN_R while cycling the ignition switch through the OFF, ACC, RUN, START and key out positions. ● **Do the PID values agree with the ignition switch states?**	
B2 CHECK GEM INTERNAL TONE OPERATION	**Yes** GO to B3 . **No** GO to B11 .
● Enter the following diagnostic mode on the diagnostic tool: GEM Active Command. ● Trigger the GEM Active Command CHIME ON and OFF. ● **Does the chime operate correctly?**	
B3 CHECK GEM INPUT FROM DOOR AJAR CIRCUIT	**Yes** GO to B11 . **No** Go To Pinpoint Test D .
● Enter the following diagnostic mode on the diagnostic tool: GEM PID. ● Monitor the GEM PID D_DR_SW, while opening and closing the driver door. ● **Do the GEM PID D_DR_SW values indicate CLOSED and AJAR correctly?**	
B4 CHECK GEM INPUT VOLTAGE FROM IGNITION SWITCH AT	

CJB FUSE 28 (15A)	
• Disconnect: CJB Fuse 28 (15A). • Measure the voltage between CJB fuse 28 (15A), pin 1, harness side and ground while cycling the ignition switch through all positions.  GK9855-A • **Is the voltage greater than 10 volts in the RUN and START positions only?**	**Yes** GO to B5 . **No** REPAIR the CJB. REPEAT the self-test. CLEAR the DTCs.
B5 CHECK GEM INPUT VOLTAGE FROM IGNITION SWITCH AT CJB FUSE 32 (15A)	
• Disconnect: CJB Fuse 32 (15A). • Measure the voltage between CJB fuse 32 (15A), pin 1, harness side and ground while cycling the ignition switch through all positions.  GK9856-A • **Is the voltage greater than 10 volts in the RUN and ACC positions only?**	**Yes** GO to B6 . **No** REPAIR the CJB. REPEAT the self-test. CLEAR the DTCs.
B6 CHECK GEM VOLTAGE INPUT CIRCUITS FOR OPEN — IGNITION SWITCH CIRCUIT 911 (WH/LG)	
• Disconnect: CJB Fuse 28 (15A). • Disconnect: GEM C201e. • Insert the ignition key. Measure the resistance between GEM C201e pin 8, circuit 911 (WH/LG), harness side and CJB Fuse 28 (15A) pin 2, circuit 911 (WH/LG), harness side.  GK9857-A • **Is the resistance less than 5 ohms?**	**Yes** GO to B7 . **No** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs.
B7 CHECK GEM VOLTAGE INPUT CIRCUITS FOR OPEN — IGNITION SWITCH CIRCUIT 1002 (BK/PK)	

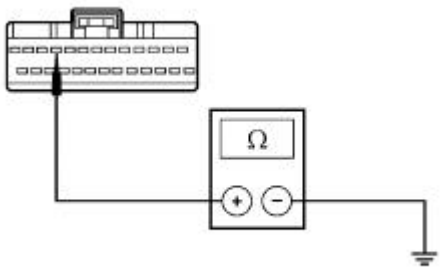
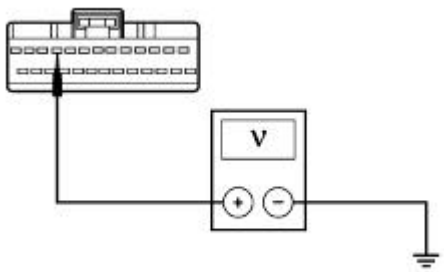
• Measure the resistance between GEM C201e pin 22, circuit 1002 (BK/PK), harness side and CJB Fuse 32 (15A), pin 2, circuit 1002 (BK/PK), harness side.  GK9858-A • **Is the resistance less than 5 ohms?**	**Yes** GO to B8 . **No** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs.
B8 CHECK GEM INPUT CIRCUIT FOR OPEN — KEY-IN-IGNITION SWITCH CIRCUIT 158 (BK/PK)	
• Measure the resistance between GEM C201e pin 9, circuit 158 (BK/PK), harness side and ground.  GK9859-A • **Is the resistance less than 5 ohms?**	**Yes** GO to B9 . **No** REPAIR circuit 158 (BK/PK) and key-in-ignition switch for failure. REFER to Switch—Key-In-Ignition Warning . REPEAT the self-test. CLEAR the DTCs.
B9 CHECK GEM VOLTAGE INPUT CIRCUITS FOR SHORT TO POWER — IGNITION SWITCH CIRCUITS 911 (WH/LG), AND 1002 (BK/PK)	
• Key in OFF position. • Disconnect: CJB Fuse 28 (15A). • Disconnect: CJB Fuse 32 (15A). • Disconnect: GEM C201e. • Remove the ignition key. Measure the voltage between GEM C201e pin 8, circuit 911 (WH/LG), harness side and ground, and between GEM C201e pin 22, circuit 1002 (BK/PK), harness side and ground.  GA5925-A • **Are the voltages greater than 10 volts?**	**Yes** REPAIR the circuit in question. REPEAT the self-test. CLEAR the DTCs. **No** GO to B10 .
B10 CHECK GEM INPUT CIRCUIT FOR SHORT TO GROUND —- KEY-IN-IGNITION SWITCH CIRCUIT 158 (BK/PK)	
• Disconnect: GEM C201e. • Remove the ignition key. Measure the resistance between GEM C201e pin 9, circuit 158 (BK/PK), harness side and	**Yes** GO to B11 .

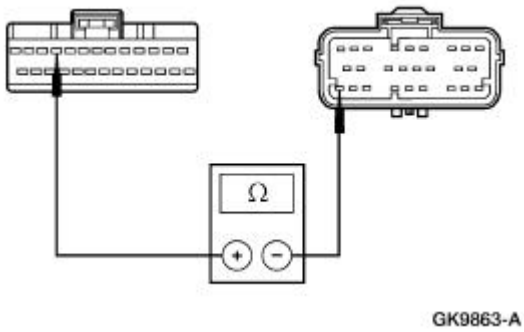
ground.  GK9859-A ● **Is the resistance greater than 10,000 ohms?**	**No** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs.
B11 CHECK FOR CORRECT MODULE OPERATION	

● Check:
  ● for corrosion
  ● for pushed-out pins
  ● connector seated correctly
● Connect any disconnected connectors.
● Make sure all other system connectors are fully seated.
● Operate the system and verify the concern is still present.
● **Is the concern still present?**
	Yes
	INSTALL a new GEM. REFER to Section 419-10 . CLEAR the DTCs. REPEAT the GEM self-test.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST C: A CHIME DOES NOT OPERATE CORRECTLY—AIR BAG

Test Step	Result / Action to Take
C1 CHECK CONTINUOUS DTCS AND RESTRAINT CONTROL MODULE (RCM)	
● Connect the diagnostic tool. ● Enter the following diagnostic mode on the diagnostic tool: RCM On-Demand Self-Test. ● Carry out Continuous DTCs and On Demand RCM Self-Tests. ● **Are any RCM DTCs received?**	**Yes** REFER to Section 501-20B . **No** GO to C2 .
C2 CHECK IGNITION STATES	
● Enter the following diagnostic mode on the diagnostic tool: GEM PID. ● Monitor the GEM PIDS IGN_KEY, IGN_A, IGN_S, and IGN_R while cycling the ignition switch through the OFF, ACC, RUN, START and key out positions. ● **Do the PID values agree with the ignition switch states?**	**Yes** GO to C3 . **No** Go To Pinpoint Test B .
C3 CHECK GEM INTERNAL TONE OPERATION	
● Enter the following diagnostic mode on the diagnostic tool: GEM Active Command. ● Trigger the GEM active command CHIME ON and OFF. ● **Does the chime operate correctly?**	**Yes** GO to C4 . **No**

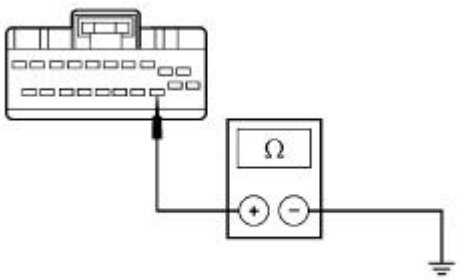
	GO to C8 .
C4 CHECK GEM INPUT FROM RCM — AIR BAG WARNING CHIME ● Key in OFF position. ● Disconnect: RCM C2041. ● Enter the following diagnostic mode on the diagnostic tool: GEM PID. ● Monitor the GEM PID ABCHIME. ● **Does the GEM PID ABCHIME read ON?**	**Yes** GO to C5 . **No** GO to C6 .
C5 CHECK CIRCUIT 1083 (LB/BK) FOR SHORT TO GROUND ● Disconnect: RCM C2041. ● Disconnect: GEM C201e. ● Measure resistance between GEM C201e pin 10, circuit 1083 (LB/BK), harness side and ground.  GK9861-A ● **Is the resistance greater than 10,000 ohms?**	**Yes** GO to C8 . **No** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs.
C6 CHECK CIRCUIT 1083 (LB/BK) FOR SHORT TO POWER ● Disconnect: RCM C2041e. ● Disconnect: GEM C201e. ● Measure the voltage between GEM C201e pin 10, circuit 1083 (LB/BK), harness side and ground.  GK9862-A ● **Is voltage greater than 10 volts?**	**Yes** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs. **No** GO to C7 .
C7 CHECK CIRCUIT 1083 (LB/BK) FOR OPEN ● Disconnect: RCM C2041e. ● Disconnect: GEM C201e. ● Measure the resistance between GEM C201e pin 10, circuit 1083 (LB/BK), harness side and RCM C2041e pin 26, circuit 1083 (LB/BK), harness side.	**Yes** GO to C8 . **No** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs.

 ● **Is the resistance less than 5 ohms?**	
C8 CHECK FOR CORRECT MODULE OPERATION	

● Check:
  ● for corrosion
  ● for pushed-out pins
  ● connector seated correctly
● Connect any disconnected connectors.
● Make sure all other system connectors are fully seated.
● Operate the system and verify the concern is still present.
● **Is the concern still present?**
	Yes
	INSTALL a new GEM. REFER to Section 419-10 . CLEAR the DTCs. REPEAT the GEM self-test.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

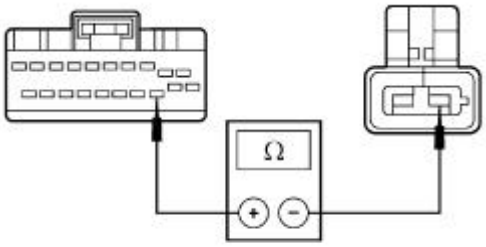
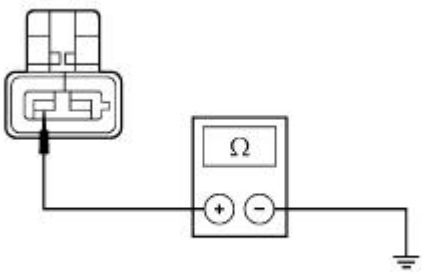
PINPOINT TEST D: THE DOOR AJAR CHIME DOES NOT OPERATE CORRECTLY

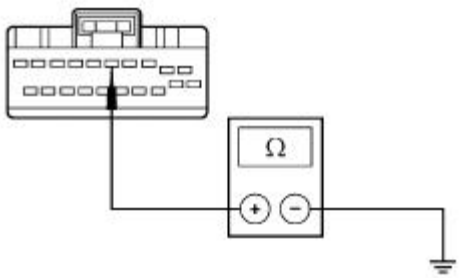
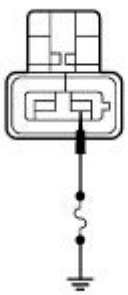
Test Step	Result / Action to Take
D1 CHECK IGNITION STATES	
● Connect the diagnostic tool. ● Enter the following diagnostic mode on the diagnostic tool: GEM PID. ● Monitor the GEM PIDS IGN_KEY, IGN_A, IGN_S, and IGN_R while cycling the ignition switch through the OFF, ACC, RUN, START and key out positions. ● **Do the PID values agree with the ignition switch states?**	**Yes** GO to D2 . **No** GO to Pinpoint Test B .
D2 CHECK GEM INTERNAL TONE OPERATION	
● Enter the following diagnostic mode on the diagnostic tool: GEM Active Command. ● Trigger the GEM active command CHIME ON and OFF. ● **Does the chime operate correctly?**	**Yes** GO to D3 . **No** GO to D17 .
D3 CHECK GEM INPUT — DRIVER DOOR AJAR CIRCUIT	
● Enter the following diagnostic mode on the diagnostic tool: GEM PID. ● Monitor the GEM PID D_DR_SW while opening and closing the driver door. ● **Do the GEM PID D_DR_SW values indicate CLOSED and AJAR correctly?**	**Yes** GO to D4 . **No** GO to D5 .
D4 CHECK GEM INPUT — PASSENGER DOOR AJAR CIRCUIT	

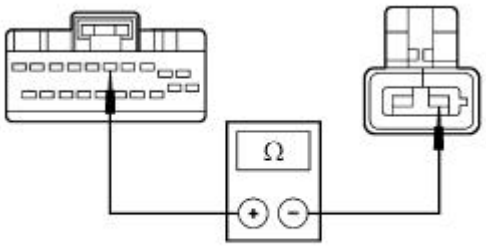
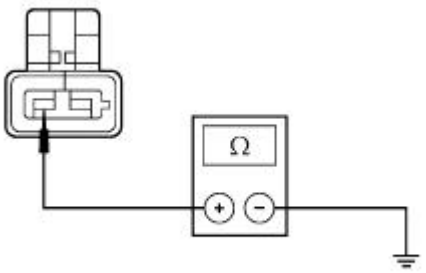
• Enter the following diagnostic mode on the diagnostic tool: GEM PID. • Monitor the GEM PID P_DR_SW while opening and closing the passenger door. • **Do the GEM PID P_DR_SW values indicate CLOSED and AJAR correctly?**	**Yes** GO to D17 . **No** GO to D11 .
D5 CHECK CIRCUIT 765 (YE/BK) AND DRIVER DOOR AJAR SWITCH FOR OPEN OR SHORT TO GROUND	
• Enter the following diagnostic mode on the diagnostic tool: GEM PID. • Monitor the GEM PID D_DR_SW while opening and closing the driver door. • **Does the GEM PID D_DR_SW value indicate AJAR with driver door closed?**	**Yes** GO to D6 . **No** GO to D8 .
D6 ISOLATE SHORT TO GROUND ON CIRCUIT 765 (YE/BK)	
• Disconnect: Driver Door Ajar Switch C526. • Enter the following diagnostic mode on the diagnostic tool: GEM PID. • Monitor the GEM PID D_DR_SW. • **Does GEM PID D_DR_SW read CLOSED?**	**Yes** INSTALL a new driver door ajar switch. REFER to Section 501-14A . REPEAT the self-test. CLEAR the DTCs. **No** GO to D7 .
D7 CHECK CIRCUIT 765 (YE/BK) FOR SHORT TO GROUND BETWEEN GEM AND DRIVER DOOR AJAR SWITCH	
• Disconnect: GEM C201c. • Measure the resistance between GEM C201c pin 13, circuit 765 (YE/BK), harness side and ground.  GK9864-A • **Is the resistance greater than 10,000 ohms?**	**Yes** GO to D17 . **No** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs.
D8 CHECK CIRCUIT 765 (YE/BK) FOR OPEN	
• Disconnect: Driver Door Ajar Switch C526. • Enter the following diagnostic mode on the diagnostic tool: GEM PID. • Connect a 10A fused jumper wire between driver door ajar switch C526 pin 2, circuit 765 (YE/BK), harness side and ground while monitoring GEM PID D_DOOR.	**Yes** GO to D10 . **No** GO to D9 .

GK9865-A

- **Does GEM PID D_DR_SW indicate AJAR with jumper wire installed?**

D9 CHECK CIRCUIT 765 (YE/BK) FOR OPEN BETWEEN GEM AND DRIVER DOOR AJAR SWITCH	
• Disconnect: GEM C201c. • Measure the resistance between GEM C201c pin 13, circuit 765 (YE/BK), harness side and driver door ajar switch C526 pin 2, circuit 765 (YE/BK), harness side.  GK9866-A • **Is the resistance less than 5 ohms?**	**Yes** GO to D17 . **No** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs.
D10 CHECK CIRCUIT 1205 (BK) FOR OPEN BETWEEN DRIVER DOOR AJAR SWITCH AND GROUND	
• Disconnect: Driver Door Ajar Switch C526. • Measure the resistance between driver door ajar switch C526 pin 1, circuit 1205 (BK), harness side and ground.  GK9867-A • **Is the resistance less than 5 ohms?**	**Yes** INSTALL a new driver door ajar switch. REFER to Section 501-14A . REPEAT the self-test. CLEAR the DTCs. **No** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs.
D11 ISOLATE OPEN OR SHORT TO GROUND ON CIRCUIT 761 (GN/RD)	
• Enter the following diagnostic mode on the diagnostic tool: GEM PID. • Monitor the GEM PID P_DR_SW, while opening and closing the passenger door. • **Does the GEM PID P_DR_SW value indicate AJAR with the passenger door closed?**	**Yes** GO to D12 . **No** GO to D14 .
D12 ISOLATE SHORT TO GROUND ON CIRCUIT 761 (GN/RD)	

• Disconnect: Passenger Door Ajar Switch C602. • Enter the following diagnostic mode on the diagnostic tool: GEM PID. • Monitor the GEM PID P_DR_SW. • **Does GEM PID P_DR_SW read CLOSED?**	**Yes** INSTALL a new passenger door ajar switch. REFER to Section 501-14A. REPEAT the self-test. CLEAR the DTCs. **No** GO to D13.
D13 CHECK CIRCUIT 761 (GN/RD) FOR SHORT TO GROUND BETWEEN GEM AND PASSENGER DOOR AJAR SWITCH	
• Disconnect: GEM C201c. • Measure the resistance between GEM C201c pin 5, circuit 761 (GN/RD), harness side and ground.  GK9868-A • **Is the resistance greater than 10,000 ohms?**	**Yes** GO to D17. **No** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs.
D14 ISOLATE OPEN CIRCUIT 761 (GN/RD)	
• Disconnect: Passenger Door Ajar Switch C602. • Enter the following diagnostic mode on the diagnostic tool: GEM PID. • Connect a 10A fused jumper wire between the passenger door ajar switch C602 pin 2, circuit 761 (GN/RD), harness side and ground while monitoring the GEM PID P_DR_SW.  GK9865-A • **Does GEM PID P_DR_SW read AJAR with jumper wire installed?**	**Yes** GO to D16. **No** GO to D15.
D15 CHECK FOR OPEN ON CIRCUIT 761 (GN/RD) BETWEEN GEM AND PASSENGER DOOR AJAR SWITCH	
• Disconnect: GEM C201c. • Measure the resistance between GEM C201c pin 5, circuit 761 (GN/RD), harness side and passenger door ajar switch C602 pin 2, circuit 761 (GN/RD), harness side.	**Yes** GO to D17. **No** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs.

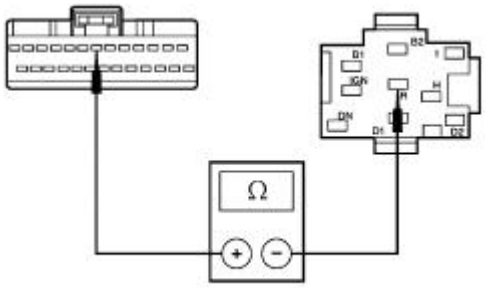
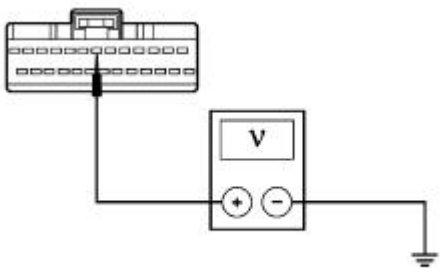
 GK9869-A ● **Is the resistance less than 5 ohms?**	
D16 CHECK CIRCUIT 1205 (BK) FOR OPEN BETWEEN PASSENGER DOOR AJAR SWITCH AND GROUND	
● Measure the resistance between passenger door ajar switch C602 pin 1, circuit 1205 (BK), harness side and ground.  GK9867-A ● **Is the resistance less than 5 ohms?**	**Yes** INSTALL a new passenger door ajar switch. REFER to Section 501-14A . REPEAT the self-test. CLEAR the DTCs. **No** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs.
D17 CHECK FOR CORRECT MODULE OPERATION	

● Check:
  ● for corrosion
  ● for pushed-out pins
  ● connector seated correctly
● Connect any disconnected connectors.
● Make sure all other system connectors are fully seated.
● Operate the system and verify the concern is still present.
● **Is the concern still present?**
	Yes
	INSTALL a new GEM. REFER to Section 419-10 . CLEAR the DTCs. REPEAT the GEM self-test.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST E: THE HEADLAMP ON REMINDER CHIME DOES NOT OPERATE CORRECTLY

Test Step	Result / Action to Take
E1 CHECK FOR CORRECT OPERATION OF THE HEADLAMP SWITCH	
● Cycle the headlamp switch through all positions to verify correct operation of exterior lighting circuits. ● **Do all exterior lamps operate correctly?**	**Yes** GO to E2 . **No** REFER to Section 417-01 .

E2 CHECK IGNITION STATES	
• Connect the diagnostic tool. • Enter the following diagnostic mode on the diagnostic tool: GEM PID. • Monitor the GEM PIDS IGN_KEY, IGN_A, IGN_S, and IGN_R while cycling the ignition switch through the OFF, ACC, RUN, START and key out positions. • **Do the PID values agree with the ignition switch states?**	**Yes** GO to E3 . **No** Go To Pinpoint Test B .
E3 CHECK GEM INTERNAL TONE OPERATION	
• Enter the following diagnostic mode on the diagnostic tool: GEM Active Command. • Trigger the GEM active command CHIME ON and OFF. • **Does the chime operate correctly?**	**Yes** GO to E4 . **No** GO to E9 .
E4 CHECK GEM INPUT FROM DOOR AJAR CIRCUIT	
• Enter the following diagnostic mode on the diagnostic tool: GEM PID. • Monitor the GEM PID D_DR_SW while opening and closing the driver door. • **Do the GEM PID D_DR_SW values indicate CLOSED and AJAR correctly?**	**Yes** GO to E5 . **No** GO to Pinpoint Test D .
E5 MONITOR EXTERIOR LAMP INPUT FOR CORRECT STATE	
• Key in OFF position. • Enter the following diagnostic mode on the diagnostic tool: GEM PID. • Monitor the GEM PID PARK_SW, while triggering the headlamp switch ON and OFF. • **Do the GEM PID PARK_SW values indicate ON and OFF correctly?**	**Yes** GO to E9 . **No** GO to E6 .
E6 CHECK EXTERIOR LAMP INPUT CIRCUIT FOR SHORT TO POWER — GEM PID PARK_SW	
• Key in OFF position. • Enter the following diagnostic mode on the diagnostic tool: GEM PID. • Monitor the GEM PID PARK_SW, while opening and closing the driver door. • **Does the GEM PID PARK_SW value always indicate ON?**	**Yes** GO to E8 . **No** GO to E7 .
E7 CHECK CIRCUIT 14 (BN) FOR OPEN	
• Key in OFF position. • Disconnect: GEM C201c. • Disconnect: Headlamp Switch C205. • Measure the resistance between GEM C201c pin 7, circuit 14 (BN), harness side and headlamp switch C205 pin R, circuit 14 (BN), harness side.	**Yes** GO to E9 . **No** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs.

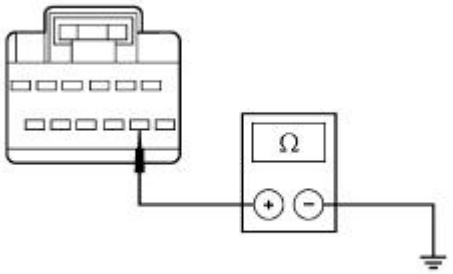
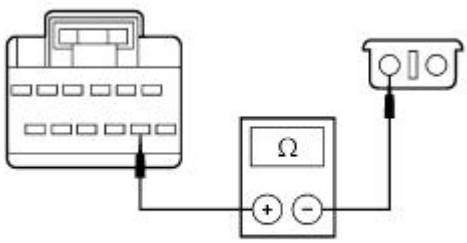
 GK9870-A ● **Is the resistance less than 5 ohms?**	
E8 TEST CIRCUIT 14 (BN) FOR SHORT TO BATTERY	
● Key in OFF position. ● Disconnect: GEM C201c. ● Set the headlamp switch in the OFF position. Measure the voltage between GEM C201c pin 7, circuit 14 (BN), harness side and ground.  GK9871-A ● **Is the voltage greater than 10 volts?**	**Yes** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs. **No** GO to E9 .
E9 CHECK FOR CORRECT MODULE OPERATION	

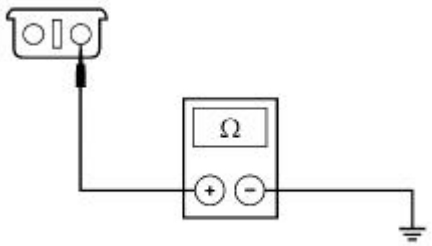
● Check:
  ● for corrosion
  ● for pushed-out pins
  ● connector seated correctly
● Connect any disconnected connectors.
● Make sure all other system connectors are fully seated.
● Operate the system and verify the concern is still present.
● **Is the concern still present?**
	Yes
	INSTALL a new GEM. REFER to Section 419-10 . CLEAR the DTCs. REPEAT the GEM self-test.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

PINPOINT TEST F: THE SAFETY BELT WARNING CHIME DOES NOT OPERATE CORRECTLY

Test Step	Result / Action to Take
F1 CHECK IGNITION STATES	
NOTE: Verify the belt minder is activated before diagnosing. ● Connect the diagnostic tool. ● Enter the following diagnostic mode on the diagnostic tool: GEM PID.	**Yes** GO to F2 . **No** Go To Pinpoint Test B .

• Monitor the GEM PIDS IGN_KEY, IGN_A, IGN_S, and IGN_R while cycling the ignition switch through the OFF, ACC, RUN, START and key out positions. • **Do the PID values agree with the ignition switch states?**	
F2 DETERMINE IF THE GEM IS RECEIVING CORRECT SAFETY BELT SWITCH STATUS	
• Key in ON position. • Enter the following diagnostic mode on the diagnostic tool: GEM PID. • Monitor the GEM PID D_SBELT while buckling and unbuckling the driver safety belt. • **Does the GEM PID D_SBELT read OUT and IN correctly?**	**Yes** GO to F3 . **No** GO to F5 .
F3 CHECK THE GEM INTERNAL TONE OPERATION	
• Enter the following diagnostic mode on the diagnostic tool: GEM Active Command. • Trigger the GEM active command CHIME ON and OFF. • **Does the chime operate correctly?**	**Yes** GO to F4 . **No** GO to F11 .
F4 CHECK THE SAFETY BELT WARNING LAMP OPERATION	
• Cycle the ignition switch from OFF to RUN while monitoring the instrument cluster safety belt indicator lamp. • **Does instrument cluster safety belt indicator lamp illuminate for approximately three seconds?**	**Yes** GO to F11 . **No** REFER to Section 413-01 .
F5 DETERMINE IF CIRCUIT 85 (BN/LB) IS OPEN OR SHORTED TO GROUND	
• Enter the following diagnostic mode on the diagnostic tool: GEM PID. • Monitor the GEM PID D_SBELT, while buckling and unbuckling the driver safety belt. • **Does the GEM PID D_SBELT value indicate OUT with the driver safety belt buckled?**	**Yes** GO to F6 . **No** GO to F8 .
F6 ISOLATE THE SHORT TO GROUND ON CIRCUIT 85 (BN/LB)	
• Disconnect: Safety Belt Switch C323. • Enter the following diagnostic mode on the diagnostic tool: GEM PID. • Monitor the GEM PID D_SBELT. • **Does the GEM PID D_SBELT value indicate IN?**	**Yes** INSTALL a new safety belt switch. REPEAT the self-test. CLEAR the DTCs. **No** GO to F7 .
F7 CHECK CIRCUIT 85 (BN/LB) FOR A SHORT TO GROUND BETWEEN GEM AND SAFETY BELT SWITCH	
• Disconnect: GEM C201d. • Measure the resistance between GEM C201d pin 8, circuit 85 (BN/LB), harness side and ground.	**Yes** GO to F11 . **No** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs.

 GK9872-A ● **Is the resistance greater than 10,000 ohms?**	
F8 ISOLATE OPEN ON CIRCUIT 85 (BN/LB)	
● Disconnect: Safety Belt Switch C323. ● Enter the following diagnostic mode on the diagnostic tool: GEM PID. ● Connect a 10A fused jumper wire between safety belt switch C323 pin 2, circuit 85 (BN/LB), harness side and ground while monitoring GEM PID D_SBELT. GK9873-A ● **Does GEM PID GEM PID D_SBELT read OUT with jumper wire installed?**	**Yes** GO to F10 . **No** GO to F9 .
F9 CHECK CIRCUIT 85 (BN/LB) FOR OPEN BETWEEN GEM AND SEATBELT SWITCH	
● Disconnect: Safety Belt Switch C323. ● Disconnect: GEM C201b. ● Measure the resistance between GEM C201b pin 8, circuit 85 (BN/LB), harness side and safety belt switch C323 pin 2, circuit 85 (BN/LB), harness side.  GK9874-A ● **Is the resistance less than 5 ohms?**	**Yes** GO to F11 . **No** REPAIR the circuit. CLEAR the DTCs. TEST the system for normal operation.
F10 CHECK CIRCUIT 1205 (BK) FOR AN OPEN CIRCUIT BETWEEN SAFETY BELT SWITCH AND GROUND	
● Disconnect: Safety Belt Switch C323. ● Measure the resistance between the safety belt switch C323 pin 1, circuit 1205 (BK), harness side and ground.	**Yes** INSTALL a new safety belt switch. REPEAT the self-test. CLEAR the DTCs.

 GK9875-A ● **Is the resistance less than 5 ohms?**	**No** REPAIR the circuit. REPEAT the self-test. CLEAR the DTCs.
F11 CHECK FOR CORRECT MODULE OPERATION	

● Check:
  ● for corrosion
  ● for pushed-out pins
  ● connector seated correctly
● Connect any disconnected connectors.
● Make sure all other system connectors are fully seated.
● Operate the system and verify the concern is still present.
● **Is the concern still present?**
	Yes
	INSTALL a new GEM. REFER to Section 419-10 . CLEAR the DTCs. REPEAT the GEM self-test.
	
	No
	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

Belt Minder Deactivating/Activating

Preparation

1. Before deactivating/activating the belt minder, set the parking brake.
2. Place the gearshift in P (Park) (automatic transmission) or the neutral position (manual transmission).
3. Place the ignition switch in the OFF position.
4. Close all the vehicle doors.
5. Unbuckle the driver safety belt.
6. Place the parklamps/headlamps switch in the OFF position. (If the vehicle is equipped with Autolamps, this will not affect the procedure.)

Deactivating/Activating

1. Turn the ignition switch to the RUN position. (Do not start the engine.)
2. Wait until the safety belt warning lamp turns off. (approximately one to two minutes)
3. **NOTE:** Steps 3 through 5 must be completed within 60 seconds or the procedure must be repeated.

   Buckle then unbuckle the safety belt three times, ending with the safety belt unbuckled. This portion of the procedure can be done before or during belt minder warning activation.
4. Turn the parklamps/headlamps on then off.
5. Buckle then unbuckle the safety belt three times ending with the safety belt unbuckled. After this step the safety belt warning lamp will be illuminated for three seconds.
6. Within seven seconds of the safety belt warning lamp turning off, buckle then unbuckle the safety belt. This will enable the belt minder if disabled or disable the belt minder if enabled.
7. The following sequence of events confirm the belt minder is enabled:
   - flashing of the safety belt warning belt lamp four times per second for three seconds
   - three seconds with the safety belt lamp off
   - flashing the safety belt lamp four times per second for three seconds again
8. The safety belt lamp flashing four times per second for three seconds provides confirmation that the belt minder is disabled.
9. After confirmation, the deactivation/activation procedure is complete.

Switch —Door Ajar

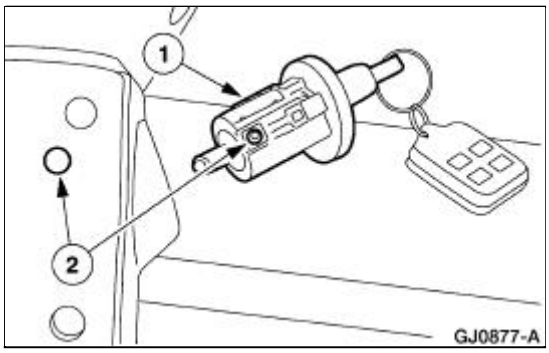
Removal and Installation

For additional information, refer to Section 501-14A .

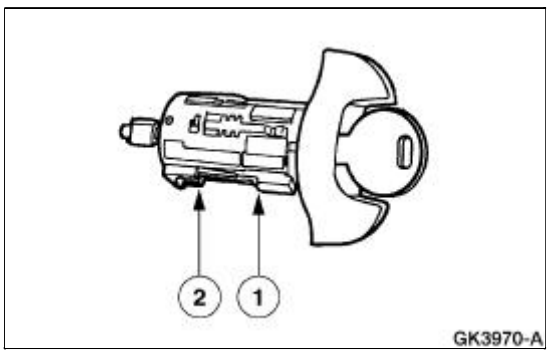
Switch —Key-In-Ignition Warning

Removal

1. Remove the ignition switch lock cylinder.
    1. Insert the ignition key and turn to the RUN position.
    2. Insert a punch in the access hole of the steering column and press the release tab while pulling out the ignition switch lock cylinder.



2. Remove the key-in-ignition warning switch.
    1. Release the clip.
    2. Push the key-in-ignition warning switch off the rear of the ignition switch lock cylinder.



Installation

1. To install, reverse the removal procedure.
    - Verify ignition switch lock cylinder operation.

GG0617-A

Module —Generic Electronic (GEM)

Removal and Installation

For additional information, refer to Section 419-10 .